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An Analysis of the Relationship Between Teacher Variables and Student Achievement Scores in  
Hamblen County, Tennessee

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A dissertation  
presented to  
the faculty of the Department of Educational Leadership and Policy Analysis  
East Tennessee State University

In partial fulfillment  
of the requirements for the degree  
Doctor of Education

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by  
Anne Nelson  
August 2008

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Dr. Jasmine Renner, Chair  
Dr. Eric Glover  
Dr. James Lampley  
Dr. Elizabeth Ralston

Keywords: Student Achievement, Teacher Absenteeism, Teacher Examination Score,  
Years of Experience

## ABSTRACT

### An Analysis of the Relationship Between Teacher Variables and Student Achievement Scores in Hamblen County, Tennessee

by

Anne Nelson

The purpose of this study was to determine if a relationship exists between teacher variables and the Tennessee Comprehensive Assessment Program (TCAP) student annual scores in reading and mathematics for students in grades 3 through 8 in Hamblen County, Tennessee. The teacher variables included number of days absent, Praxis II Principles of Learning and Teaching (PLT) scores, and years of experience. The population of the study was limited to 3rd- through 8th-grade reading and mathematics teachers employed by the Hamblen County school district during the 2006-2007 school year. Raw scores from the 2006-2007 TCAP criterion-referenced assessment were used as the testing variable. A Pearson correlation coefficient was used to analyze teacher absenteeism. Praxis II PLT scores were grouped as above or below median scores and analyzed with an independent samples *t* test. Years of experience was defined by the state department of education as vested years of experience and grouped using an analysis of variance. Based on analysis of the findings, the relationship between teachers' days absent, Praxis II PLT scores, and years of experience and TCAP achievement annual scores in reading and mathematics for students in grades 3 through 8 in Hamblen County, Tennessee were not statistically significant.

## DEDICATION

This dissertation is dedicated to my husband, Michael Nelson, whose persistence kept me focused on the task. Thank you, Mike, for the many delicious suppers cooked and for the consideration, support, and encouragement shown to me throughout the long process required to reach a personal goal.

## ACKNOWLEDGMENTS

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## CONTENTS

	Page
ABSTRACT .....	2
DEDICATION .....	3
ACKNOWLEDGMENTS .....	4
LIST OF TABLES .....	8
LIST OF FIGURES .....	9
Chapter	
1. INTRODUCTION .....	11
Statement of the Problem.....	15
Research Questions.....	16
Significance of the Study .....	17
Delimitations and Limitations.....	19
Definitions of Terms.....	19
Summary .....	21
Overview of the Study .....	22
2. REVIEW OF LITERATURE .....	23
Achievement Testing .....	23
Teacher Absenteeism.....	28
Teacher Examination Scores.....	32
Years of Experience.....	37
Summary .....	45
3. METHODS AND PROCEDURES.....	47
Research Design.....	47

Chapter	Page
Research Questions and Hypotheses .....	48
Research Population.....	49
Instrumentation .....	50
Procedures.....	51
Data Analysis .....	51
Summary .....	52
4. ANALYSIS OF DATA.....	53
Analysis of Research Questions.....	53
Research Question #1 .....	53
Research Question #2 .....	55
Research Question #3 .....	57
Research Question #4 .....	59
Research Question #5 .....	60
Research Question #6 .....	70
5. SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS.....	80
Summary of Findings.....	80
Research Question #1 .....	81
Research Question #2 .....	82
Research Question #3 .....	82
Research Question #4 .....	83
Research Question #5 .....	84
Research Question #6 .....	85
Conclusions.....	86
Recommendation for Practice.....	88
Recommendations for Further Research.....	88

Chapter	Page
REFERENCES .....	90
APPENDICES .....	94
APPENDIX A: Letter to Director of Schools.....	94
APPENDIX B: TCAP and Content Standard Alignment Summary .....	95
APPENDIX C: TACP Score and Reliability Summary .....	100
APPENDIX D: Teacher Attendance in Developing Countries .....	101
VITA .....	102



## LIST OF TABLES

Table	Page
1. Praxis II Principles of Learning and Teaching Mean Scores.....	57
2. Number of Reading and Mathematics Teachers by Grade Level and Years of Experience.....	61
3. Means and Standard Deviations for Third-Grade Reading by Teachers' Years of Experience.....	62
4. Means and Standard Deviations for Fourth-Grade Reading by Teachers' Years of Experience.....	63
5. Means and Standard Deviations for Fifth-Grade Reading by Teachers' Years of Experience.....	65
6. Means and Standard Deviations for Sixth-Grade Reading by Teachers' Years of Experience.....	66
7. Means and Standard Deviations for Seventh-Grade Reading by Teachers' Years of Experience .....	68
8. Means and Standard Deviations for Eighth-Grade Reading by Teachers' Years of Experience .....	69
9. Means and Standard Deviations for Third-Grade Math by Teachers' Years of Experience .....	71
10. Means and Standard Deviations for Fourth-Grade Math by Teachers' Years of Experience .....	73
11. Means and Standard Deviations for Fifth-Grade Math by Teachers' Years of Experience.....	74
12. Means and Standard Deviations for Sixth-Grade Math by Teachers' Years of Experience.....	76
13. Means and Standard Deviations for Seventh-Grade Math by Teachers' Years of Experience .....	77
14. Means and Standard Deviations for Eighth-Grade Math by Teachers' Years of Experience.....	79

## LIST OF FIGURES

Figure	Page
1. Boxplot for Praxis II Principles of Learning and Teaching Scores and TCAP Achievement Scores in Reading for Students in Grades Three Through Eight .....	58
2. Boxplot for Praxis II Principles of Learning and Teaching Scores and TCAP Achievement Scores in Mathematics for Students in Grades Three Through Eight .....	60
3. Boxplot for Teacher Years of Experience and Third-Grade TCAP Achievement Scores in Reading .....	62
4. Boxplot for Teacher Years of Experience and Fourth-Grade TCAP Achievement Scores in Reading .....	64
5. Boxplot for Teacher Years of Experience and Fifth-Grade TCAP Achievement Scores in Reading .....	65
6. Boxplot for Teachers Years Experience and Sixth-Grade TCAP Achievement Scores in Reading .....	67
7. Boxplot for Teachers Years Experience and Seventh-Grade TCAP Achievement Scores in Reading .....	68
8. Boxplot for Teacher Years Experience and Eighth-Grade TCAP Achievement Scores in Reading .....	70
9. Boxplot for Teacher Years of Experience and Third-Grade TCAP Achievement Scores in Mathematics .....	72
10. Boxplot for Teacher Years of Experience and Fourth-Grade TCAP Achievement Scores in Mathematics .....	73
11. Boxplot of Teacher Years Experience and Fifth-Grade TCAP Achievement Scores in Mathematics .....	75
12. Boxplot of Teacher Years Experience and Sixth-Grade TCAP Achievement Scores in Mathematics .....	76
13. Boxplot of Teacher Years Experience and Seventh-Grade TCAP Achievement Scores in Mathematics .....	78

Figure	Page
14. Boxplot for Teacher Years Experience and Eighth-Grade TCAP Achievement Scores in Mathematics .....	79

## CHAPTER 1

### INTRODUCTION

Federal efforts to improve the status of our nation's public education system have a long history. In 1957, the launch of the Soviet-made satellite, *Sputnik*, created widespread fear of Russian dominance over the United States. The public education system soon became a focus for producing academically inferior students in our country. Schools in Russia were characterized by vigorous testing, authoritative teaching practices, and the absence of nonacademic coursework. The legislative response to this historical milestone was the *National Defense Education Act* that allocated additional funding for stringent instruction in mathematics, science, and foreign language to counteract a perception of weakness in competing with global crises (Owens, 2004).

During the mid-1960s, educational reform was characterized as a progressive movement stemming from the unpopularity of the Vietnam War. Progressive themes such as child-centered education and cultural awareness became popular. The state of public education was highlighted in a sociological study surrounding urban areas in the United States. The United States Office of Education in accordance with the *Civil Rights Act of 1964* commissioned a report to address racial relations and equality. The *Coleman Report* published in 1966 helped initiate reform movements designed to equalize educational opportunity for all students. This report determined that socially disadvantaged students performed better in racially-mixed classrooms (Kiviat, 2000).

A response to this finding included school busing to achieve racial balance within urban areas. The exit of White students and their families from urban school districts to suburban school districts prevented the full integration of classrooms as well as the measurement of student outcomes stemming from the report. Another conclusion of the *Coleman Report* determined little difference in the funding of Black schools in comparison to White schools.

Lower academic achievement of Black students was attributed to family socioeconomic status and student background rather than governmental supports to public education (Kiviat, 2000).

In 1983, the United States Department of Education's National Commission on Excellence in Education published a riveting report entitled *A Nation at Risk*. This report revealed that average achievement of high school students on standardized tests was lower than testing results from 26 years before. The College Board's Scholastic Aptitude Test (SAT) scores had decreased 50 points on verbal tests and 40 points on mathematics tests over a 17-year period. Institutions of higher education reported that nearly 25% of all mathematics courses taught were remedial courses. The Commission advocated an increase in high school graduation requirements with the inclusion of computer education, the adoption of measurable performance standards for schools, extended time for learning, and an increase in professional standards for teachers (U.S. Department of Education, 1983).

On January 8, 2002, President George W. Bush signed into law the *No Child Left Behind Act of 2001* (NCLB). This act redefines the governmental role established in the *Elementary and Secondary Education Act* of 1965. *No Child Left Behind* is regarded as a bipartisan effort to close the achievement gap between low-income and minority students and achieving students in the nation's public schools. In 1998, 60% of 12th graders were reading below proficiency according to results from the National Assessment of Educational Progress (U. S. Department of Education, 2002). The *No Child Left Behind* is based on four pillars: stronger accountability for results-based outcomes, increased flexibility and local control, expanded options for parents, and an emphasis on research-based instructional methods. Increased accountability requires states to design a method of measuring student progress in accordance with specific academic standards that provide a focus for high expectations for all students. Each state must define "adequate yearly progress" to determine student achievement in every school within all school districts (U. S. Department of Education, 2002).

Since the enactment of the *No Child Left Behind Act of 2001*, school districts have increased awareness of student achievement in the academic areas. *No Child Left Behind*

requires that school districts, as well as individual schools, meet adequate yearly progress toward specific curriculum standards in the areas of reading and mathematics. This increase in accountability for student performance has been the catalyst for intensive analysis of student data and initiating state and district level policy in response to the findings (Wright, Wright, & Heath, 2003). Accountability promotes the existence of clear goals, accurate measures, and consequences for poor performance. Therefore, every state receiving federal funding must develop academic standards in all areas that are challenging and reaching above basic skill levels. In addition, proficiency levels must be established that encompass necessary skills and essential knowledge for each subject area. Accurate measures must be developed in determining the level of attainment for each student according to the standards established (Wright, Wright, & Heath, 2003).

The accountability system designed by the state includes consequences for schools that fail to make adequate yearly progress. Schools not meeting adequate yearly progress face sanctions determined by the federal government. Consequences for not making adequate yearly progress for 2 consecutive years in the same subgroup result in parent school choice. Any student attending a school failing to meet adequate yearly progress may transfer to a non-failing school at the district's expense. If a school fails to meet adequate yearly progress for 3 consecutive years, the school must provide supplemental educational services to the low-income students who remain in that school. Further sanctions can include personnel changes (Wright et al.).

Academic achievement gains begin in the classroom. At the state and district level, curriculum standards outline the performance indicators taught in the core curriculum areas of reading, mathematics, science, social studies, and language arts. In Tennessee, the Tennessee Comprehensive Assessment Program (TCAP) test measures knowledge and application in the core curriculum areas of reading, language arts, mathematics, science, and social studies for students in grades three through eight. Student academic achievement is measured by yearly test administrations (Tennessee Department of Education, 2006). School districts, teachers, and

parents are interested in determining the factors that contribute to successful student achievement in core curriculum areas. No one doubts that effective teaching is very important in raising student achievement levels. The difficulty is determining what are the variables teachers possess that contribute to student achievement and how to measure these variables. According to Sanders and Horn (1998):

Differences in teacher effectiveness were found to be the dominant factor affecting student academic gain. The importance of the effects of certain classroom contextual variables appear to be rather minor and should not be viewed as inhibiting to the appropriate use of student outcome data in teacher assessment. These results indicate that any realistic teacher evaluation process should include as a major component a reliable, valid measure of a teacher's effect on student academic growth. If the ultimate goal is the improvement in academic growth of student populations, one must conclude that improvement of student learning must begin with the improvement of relatively ineffective teachers regardless of the student placement strategies deployed within a school. (p. 253)

There are 4.5 million teachers in our country today (National Center for Educational Statistics, 2005). Investment in our students as future human capital is an astounding job that bridges generations. Demand for highly qualified teachers has initiated much research in determining the factors associated with effective teaching. Much of the research has described measurable characteristics that are extracted from a personnel file such as teachers' degree levels, experience, certification, and college majors or minors in academic areas. However, the skill sets needed to teach advanced coursework are quite different from the skill sets needed to teach students who are struggling to meet basic requirements. Highly effective teachers possess a wide range of characteristics and skills that coincide with their teaching environment (Goldhaber & Anthony, 2003).

In this study, I examined the relationship between students' reading and mathematics achievement criterion referenced raw scores for students in grades three through eight as measured by the Tennessee Comprehensive Assessment Program and three teacher variables in Hamblen County, Tennessee. These variables included teacher absenteeism, teacher examination scores, and years of teaching experience.

### *Statement of the Problem*

Student achievement begins in the classroom where teachers introduce, supervise, and monitor the daily activities associated with learning. Parents entrust the teacher with their most valued possessions for a large number of hours on a daily basis for educational benefit. School districts interview teacher candidates, conduct background checks, and choose personnel who will best meet the needs of the students. State Departments of Education grant licensure or certification to prospective teachers to practice the art of teaching. Despite the numerous procedural milestones for teachers, the desired results are not always achieved. During the 2004-2005 school year in Tennessee, the average score of fourth graders in reading at or above proficient level was below that of the national average score of fourth graders in reading attending public school. In Tennessee, 41% of public schools' fourth graders scored below the basic level in reading. The average score of Tennessee public schools' eighth graders in reading was not significantly different from the national average score of public schools' eighth graders. However, 29% of Tennessee's eighth graders scored below the proficient level in reading. In mathematics, Tennessee's public schools' fourth graders scored at or above proficient below the national average of public school fourth graders. In Tennessee, 26% of fourth graders scored below the basic level. The average score of Tennessee public schools' eighth graders was lower than the national average of public schools' eighth graders. In mathematics, 39% of Tennessee's eighth graders scored below the basic level (National Center for Educational Statistics, 2005).

The Tennessee Comprehensive Assessment Program achievement test for students in grades three through eight was chosen as the test variable for this study. The number of test cases is higher in grades 3 through 8 than the number of test cases in grades 9 through 12 in Hamblen County. The selected test participants produced a specific set of scores that was reflective of the instruction for a particular grade level and the performance of each student associated with one teacher. Achievement tests in grades 9 through 12 are less specific to grade levels or teachers. A student may take a Gateway test at multiple-grade levels during the high school experience or may repeat the test after instruction from a different teacher. The



opportunity for students to participate in the Gateway examinations for biology, English, or algebra occurs 3 times per year. Therefore, the lapse of time between instruction and testing is arbitrary. This quantitative study determined if a relationship exists between academic achievement in reading and mathematics for students in grades three through eight and three teacher variables: teacher absenteeism, teacher examination scores, and years of teaching experience in Hamblen County, Tennessee.

Darling-Hammond (2000) studied data regarding 50 state policies from the 1993-94 Schools and Staffing Surveys of the U.S. Department of Education and the National Assessment of Educational Progress. Fetler (2001) used state-wide data from California high schools. Klecker (2002) examined data from Kentucky, Tennessee, and Texas public school students. Hanushek, Kain, and Rivkin (2001) combined data from all the public elementary schools in Texas for his study on teacher retention. These macrostudies could be catalysts for policy reform at high levels but are little help to the local administrator attempting to hire the most qualified teacher for a local school district (Glass, 2002). Microstudies examining individual teacher variables in relation to student achievement scores at a local level might disclose true equity of teacher resources across the school district. The research problem for this study determined if a relationship exists between teacher variables and the Tennessee Comprehensive Assessment Program annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee.

### *Research Questions*

1. Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?
2. Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

3. Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?
4. Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP Achievement test annual scores in mathematics of students in grades three through eight?
5. Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?
6. Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

### *Significance of the Study*

A substantial amount of research has shown that student achievement might be associated with teacher effectiveness. Sanders and Rivers (1996) contended that a significant amount of student achievement is attributed to cumulative teacher effect using a value-added assessment system. However, the Sanders and Rivers analysis did not isolate characteristics of a successful teacher or a less successful teacher in terms of student achievement (Darling-Hammond, 2000). This study should contribute to the growing amount of research attempting to identify specific teacher variables that enhance or inhibit student achievement. Goldhaber (2002) stated:

The importance of teacher quality cannot be overstated. Teachers can have a profound effect on students, and school systems make a significant long-term investment when they hire teachers. Unlike other education investments, such as class size, which may easily be altered from year to year, the tenure system implies that the employment of an individual teacher is near permanent. For these reasons, the selection of teachers is of paramount importance. I would argue that this function of school systems receives too little attention at the local level (n. p).

There are as many visions of an effective teacher as there are types of students as learners. Ideal teachers should possess the ability to be analytical in solving problems associated

with different learning styles in the classroom. They must carefully monitor student progress and respond appropriately. They are expected to have competencies associated with the subject matter they teach, as well as the ability to implement instruction in an environment conducive to learning. The ideal teacher is expected to be efficient and have extensive knowledge for use in teaching a diverse population of students. Many of these attributes require a repertoire of various skills gained with experience. However, experience does not always equate expertise (Cruickshank & Haefele, 2001).

Local school districts and principals often do not have the qualitative information needed to establish a prediction of teacher effectiveness in the hiring of new teachers that enhance student achievement. This qualitative information includes professional attitude, understanding of students, creativity, and control of classroom situations. Other qualitative traits include emotional stability, ethical behavior, enthusiasm, and service to the profession. Perhaps all of the qualitative information, as well as quantitative information such as teacher examination scores and grade point averages, would better describe a prospective candidate for a teaching position. There are many exemplars of good teaching and all may serve as useful means of predicting effectiveness. Those who fail to meet any of the definitions might not be good candidates for consideration in the school district (Cruickshank & Haefele, 2001). This study identified relationships between student achievement and quantifiable teacher variables at a local level in Hamblen County, Tennessee.

The beneficiaries of this study might include superintendents and principals who are interested in the quantifiable variables of effective teachers that affect student achievement. The results of this study could be useful when selecting candidates for interviews among a field of candidates for teaching positions. District level policymakers considering incentives for good attendance or rewards for years of experience might be interested in this study. Those responsible in the district for implementing professional development that continues to inspire teachers to be better might be interested in the data analysis pertaining to years of experience.

### *Delimitations and Limitations*

Hamblen County School District, located in Morristown, Tennessee, has a student population of 9,481 students and 601 teachers (Tennessee Department of Education, 2006). This study encompassed the students and teachers in 11 elementary schools and 4 middle schools. The population of the study was 4,180 students' test scores in grades three through eight and 187 teachers of reading and mathematics. Results may not be generalized to other school districts or school populations. Participants in this study were a nonrandom sampling of the population of students and teachers within the Hamblen County, Tennessee school district.

### *Definitions of Terms*

1. *Adequate Yearly Progress* – This is the current status approach that measures if the percentage of students for the entire school and for each subgroup of students meet or exceed the annual performance targets in both reading and mathematics (Linn, 2006).
2. *Criterion referenced measurement* – This is an approach to testing in which an individual's score on a test is compared to an established set of prespecified standards of performance (Gall, Gall, & Borg, 2003).
3. *Curriculum standards* – States are required to establish challenging goals and objectives in academic content areas that specify what students are expected to know and to be able to do (Linn, 2006).
4. *Highly qualified status* – This is a component of the *No Child Left Behind Act* of 2001 that requires all teachers to have (a) a bachelor's degree, (b) full state certification or licensure, and (c) demonstrated knowledge of each subject they teach (Wright et al., 2003). In Tennessee, highly qualified status is achieved by an academic major in the core content area, fully licensed with no licensure requirements waived, or participation in the highly objective uniform state standard of evaluation (HOUSSE) method. The HOUSSE method in Tennessee has two options: the professional matrix and the use of teacher effect data (Tennessee Department of Education, 2006).

5. *Individuals With Disabilities Education Act* – This law, reauthorized in 2005, guarantees that all students with disabilities between the ages of 3 and 21 are entitled to a free and appropriate public education to the maximum extent possible. Provisions include extensive procedural requirements involving the development of the individualized education program for each child with a disability (Goldstein, Gee, & Daniel, 2000).
6. *Macro studies* – These are studies that typically use large amounts of data drawn from sources. These studies often contribute to public policy (Glass, 2002).
7. *Micro studies* – These are studies that typically use small amounts of data that may be difficult to generalize to larger settings (Glass, 2006).
8. *National Assessment of Educational Progress* – Commonly known as the Nation's Report Card, this national test reasonably provides a benchmark for comparing standards set by different states (National Center for Educational Statistics, 2003).
9. *No Child Left Behind Act of 2001* – A reauthorization of the *Elementary and Secondary Education Act* of 1965, enacted by President George W. Bush on January 8, 2002, this defines the government's role in closing the achievement gap between disadvantaged and minority students and their peers. Major principles include creating measurable academic standards, empowering parents with information, increasing professional status for teachers, and implementing research-based instruction (U. S. Department of Education, 2002).
10. *Norm referenced measurement* – This is an approach to testing in which an individual's score on a test is compared to the scores earned by a norming group (Gall et al., 2003).
11. *Praxis Series*<sup>TM</sup> – This is a standardized assessment that states may use as part of the licensing process for teaching certification. The Praxis I® assessment measures basic reading, mathematics, and writing skills. The Praxis II® assessment measures

- subject-specific knowledge and pedagogical skills. The Praxis III® assessment measures classroom-teaching skills (Educational Testing Service, 2007).
12. *Raw score* – This is an individual score on a measure as determined by the scoring key without further statistical manipulation (Gall et al.).
  13. *Section 504 of the American Disabilities Act* – This act prohibits discrimination against the disabled by any agency receiving federal financial assistance. School districts have to make reasonable accommodations and make modifications such as accessible facilities (Goldstein et al.).
  14. *Standardized test* – This is a test for which procedures have been developed to guarantee consistency in administration and scoring in all settings (Gall et al.).
  15. *Tennessee Comprehensive Assessment Program (TCAP)* – This is a standardized achievement test developed by CTB/McGraw Hill. Students in grades three through eight participate in the TCAP test each spring to measure academic achievement in the areas of reading, language arts, mathematics, science, and social studies (Tennessee Department of Education, 2006).

### *Summary*

The implementation of the *No Child Left Behind Act of 2001* requires school districts that receive federal monies to include accountability in their overall focus. Beginning with the 2005-2006 school year, school districts receiving federal funds must report adequate yearly progress in reading and mathematics for students in grades three through eight. School districts across the nation will measure student achievement on a yearly basis to chart adequate yearly progress. Teachers will guide students in acquiring the skills needed to master content standards established and tested by the State Departments of Education. In Tennessee, the Tennessee Comprehensive Assessment (TCAP) program is administered on a yearly basis for federally required accountability.

### *Overview of the Study*

Chapter 1 includes an introduction, the statement of the problem, research questions, the significance of the study, delimitations and limitations, definitions of terms used in the study, and a summary. Chapter 2 contains a comprehensive review of existing literature on student achievement testing and teacher variables. Chapter 3 includes the statistical methods and procedures applied to establish any relationship between the criterion and predictor variables. Chapter 4 provides the findings and analysis of the statistical methods applied to the data collection. Chapter 5 concludes the study with a summary of findings, conclusions, recommendations for further practice, and research, and recommendations to improve knowledge of effective teacher variables in relation to hiring practices, district policies, state requirements for teacher examinations, and national education policies.

## CHAPTER 2

### REVIEW OF LITERATURE

This review of literature explores the theory that specific teacher variables may affect achievement scores in reading and mathematics of students in grades three through eight (Darling-Hammond, 2000). In Tennessee, achievement scores are measured by the Tennessee Comprehensive Assessment Program achievement tests in reading and mathematics. Topics in this section include achievement testing, teacher absenteeism, teacher examination scores, and years of teaching experience.

#### *Achievement Testing*

In response to the enactment of *No Child Left Behind Act of 2001*, school districts have worked diligently in meeting the requirements of adequate yearly progress. School districts across the nation typically use a standardized achievement test to measure student progress. Standardized tests have uniform directions, time limits, and scoring methods to provide a level of consistency in opportunity for all students (Gall et al., 2003). The data results for annual achievement tests provide a snapshot of growth in academic achievement. Students are provided many opportunities to exhibit achievement during classroom activities; however, the standardized test score provides an objective measurement in relation to specific content standards and normed groups. Test results can be compared across a classroom, a district, a state, or the nation to provide meaningful information for diagnostic purposes. The Tennessee Comprehensive Assessment Program (TCAP) achievement test is administered every year to measure student progress and generate scores for submission to the federal government. The test measures the standards of learning expected for each grade level; therefore, no student ever takes the same test twice. The TCAP is a multiple-choice test in reading, language arts, mathematics, science, and social studies. It is a timed test given over multiple sessions that measures



knowledge and application. The 2006-2007 TCAP achievement test included norm referenced and criterion-referenced items that depict students' skill acquisition in content areas (CTB/McGraw Hill, 2003).

Despite the claims that standardized tests objectively and accurately measure students' academic gains, critics such as Berliner and Biddle (1995) argued that multiple-choice standardized tests merely measure basic skills associated with rote learning. The depth of learning associated with these tests has been characterized by low levels of skill acquisition. The higher order thinking skills of abstract reasoning, thoughtfulness, prediction, analysis, and comparison are difficult to measure on a multiple-choice test that requires "bubbling" an answer sheet. Instructional practices in the classroom in anticipation of standardized testing consist of covering the content standards of a course at break-neck speed in order to finish before the required testing dates. Recall of facts, definitions, and quick computational skills are often all that is required to measure academic achievement to meet current adequate yearly progress as defined by *No Child Left Behind*. There is no time for the investigation of the scientific method or to expand a student's natural curiosity. Multiple-choice tests of achievement are unheard of in the context of fine arts, sports, or community services. Project-oriented skills require a depth of understanding and application that are measured by a variety of criteria for performance assessment. It is reasonable to expect that core curriculum areas such as reading, language, mathematics, social studies, and science deserve similar comprehensive assessment measures (Berliner & Biddle).

Other critics of standardized testing have questioned the validation process concerning score interpretation. Validity is the appropriateness and usefulness of specific inferences made from test scores (Gall et al., 2003). Validation is viewed as a long-term endeavor designed to eliminate factors that threaten to undermine the sanctity of the test score. Compounding the problem is the condition of high stakes standardized testing. One factor influencing score outcomes are the students participating in the test. An English Language Learner (ELL) might omit large portions of the test or randomly mark answers in response to his or her inability to

read the test. The ELL student might know many facts and concepts, but because of the test being administered in an unfamiliar language the ELL student could receive a score of nonproficient. Motivation, fatigue, and incentives might play a role in student performance on any given day of test administration (Haladyna, 2006).

Other factors concerning test validity have been stringency and alignment of state curriculum standards. Many states have abandoned testing publishers in favor of testing designs customized to their standards. This might give the impression that a state has a set of scores with a high passing rate, but the test may not include questions pertaining to many content standards used on a national level. Tennessee is one state that reported higher score rates on state testing results than score rates on the National Assessment of Education Progress test. In fact, Tennessee has the highest score differential of proficient students at 66% in the 33 states administering the NAEP test of mathematics in grade 8 in 2005. This suggests that Tennessee has more lenient curriculum standards than those curriculum standards required for proficiency on the National Assessment of Educational Progress test (Linn, 2006).

The type of test preparation could compromise validity of a standardized test. Teachers responsible for administering a test year after year are easily able to identify specific objectives and skills needed for successful test completion. As federal and state governments continue to emphasize testing results, teaching to the test has become more of an incentive for the classroom teacher as a primary instructional method. These incentives might include pay raises, promotions, and accolades for superior pupil performance. Nonproficient student test scores could jeopardize teacher assignment or employment (Haladyna, 2006).

The Tennessee Comprehensive Assessment Program published by CTB/McGraw Hill (2003) has been designed to align with the state curriculum standards. The test publishers follow a sequence of activities to ensure validity and reliability in maintaining test quality. Initially, CTB/McGraw Hill, in collaboration with the state department of education, clarifies goals and objectives for testing with specifications for content, page design, grade-level appropriateness, and equity. Teachers, curriculum experts, publishers' research staff, and school district experts

determine the assessment design that aligns with prespecified curriculum standards. Editors review the assessment materials for any bias in gender, ethnicity, or role images. Scoring rubrics are created that ensure fairness. All tests published at CTB/McGraw Hill undergo pilot tests and usability studies that include feedback from teachers and students. After the pilot tests are completed, the assessment materials are published. States that desire information comparing local students with students across the nation may include previously normed test items within the assessment. Professional development activities are planned to help teachers properly administer the test and explain testing results to parents. CTB/McGraw Hill has established test-scoring centers for quick access to scoring results. Continuous evaluation is necessary to maintain the goals and objectives initially established for the test (CTB McGraw Hill, 2000).

The content validity of the Tennessee Comprehensive Assessment Program is established by the degree of adherence to the content domains addressed in the test in relation to the score results. Systematic evaluation of test items and performance indicators and review of the knowledge required is necessary to ensure representation of the objectives. It is important to remember that test score interpretation is a claim of the amount of information a student has learned in relation to other students. If the score reflects a proficient score, then the assumption is made that the teacher has delivered the curriculum material tested and the student has acquired the knowledge. The difficulty in this assumption is that key concepts may be tested but not presented well in the curriculum or not taught during the instructional period. A multitude of other variables can distort the validity of score interpretation such as students' prior knowledge, socioeconomic status, gender, or ethnicity (Gall et al., 2003). According to CTB McGraw-Hill (2003), the content validity of the TCAP test can be achieved by alignment of the test to the Tennessee Blueprint for Learning content standards (Tennessee Department of Education, 2006). The Alignment Verification Summary found in Appendix B illustrates the content alignment of the Tennessee Comprehensive Assessment Program and the performance indicators of the Tennessee Blueprint for Learning in reading, language arts, and mathematics (Tennessee Department of Education,).

The reliability of a test reflects the amount of measurement error present in the scores presented. The amount of measurement error is determined by the reliability coefficient that varies from .00 to 1.00. Tests with a reliability coefficient of .80 or better are sufficient for research purposes. Standardized test should measure a reliability of .90 or better. The Tennessee Comprehensive Assessment Program has a reliability range of .90 to .93. The Tennessee Comprehensive Assessment Program measures internal consistency reliability that is influenced by the number of items on a particular test. Therefore, more items on a specific test will increase the reliability of the test. The Number Correct Score Statistics and Test Reliability found in Appendix C lists reading, language arts, and mathematics subtest reliability identified as KR20, grade level, number of items, the mean number correct score, and standard deviation (Tennessee Department of Education, 2006).

The implementation of high stakes testing, such as standardized achievement tests, is a requirement for states to document adequate yearly progress in student achievement. Schools are striving to meet accountability standards to reflect their level of effectiveness in the educational process. Braun (2004) conducted a study to analyze student achievement results in states conducting high stakes testing in comparison with student achievement results in states that do not conduct high stakes testing for students in grade four and grade eight. Results compared with a cohort group over time indicated favorable outcomes for the high stakes testing states in grade eight. Braun cautioned that the results were tentative and more research was needed to document each state's history of accountability policy concerning high stakes testing.

Student achievement testing is a means to hold teachers and school administrators accountable in ensuring that all students are afforded educational opportunity. In accordance with *No Child Left Behind*, testing helps align content standards with instruction and convey specific expectations for learners. Testing results provide information to address closing the achievement gap among ethnic groups, students who are economically disadvantaged, and students identified with disabilities. Testing results also allow states a basis for rewarding schools or subjecting schools to sanctions for lack of adequate yearly progress. States are

required to set performance levels at a minimum of three levels. These levels in Tennessee are “advanced,” “proficient,” and “below proficient” (Linn, 2006).

In Tennessee, the Tennessee Comprehensive Assessment Program (TCAP) criterion-referenced test has been selected as the measurement instrument for grades three through eight in meeting adequate yearly progress as required by the *No Child Left Behind Act of 2001*. The Tennessee Department of Education notifies school districts of a 3-week window to administer the test. Local educational districts set the exact dates for the weeklong testing administration. In Hamblen County, the TCAP is administered the 3rd week in April. Content areas tested for grades three through eight include reading-language arts, mathematics, science, and social studies. Only the score results for reading-language arts and mathematics are submitted to the federal government for meeting adequate yearly progress under the *No Child Left Behind* guidelines. Each content area is composed of performance indicators that are objectives aligned with the Tennessee Blueprint for Learning. The Tennessee Blueprint for Learning is the curriculum standard set by the Tennessee Department of Education for each subject area (Tennessee Department of Education, 2006).

### *Teacher Absenteeism*

When a certified teacher is absent, a substitute teacher is provided by the district to fill the need for supervision. The cost to the system includes both the absent teacher and the substitute’s rate of pay. A number of factors limit the effectiveness of a substitute teacher. A temporary substitute is often employed for a few days and does not have time to get to know the students. This lack of information regarding student ability level could prevent the learning required to meet the objectives of the curriculum. Substitute teachers are often left with assignments that do not contribute to new learning experiences for students. The students immediately sense the gap in cognition required and recognize the lack of challenge in the assignment. Misbehavior often occurs during the lack of instructional time and instruction is lost (Woods, 1997).

According to Black (2003), social factors that could attribute to teacher absenteeism include stress-related illness. Administrators who involve teachers in the broader scope of the school could reduce feelings of isolation. Participating in staff interviews, providing mentoring opportunities, and recognizing exemplary classroom performance are activities that administrators could use to reduce stress for teachers. Encouraging teachers to participate in professional development could remedy lack of proper training in dealing with difficult students. Using a teacher's expertise as well as community resources could provide opportunities for teachers to learn coping skills (Black).

In 2002, the Pittsburgh Foundation initiated a study to investigate the market for substitute teachers (Strauss & Strauss, 2003). Full-time teachers in South West Pennsylvania reported they were absent about 14.1 days per school year or approximately 7.8% in 2001-2002. An earlier study by the Utah State Substitute Teacher's Institute indicated that a substitute teacher delivered approximately 10% of a student's total public school instruction. The U.S. Bureau of Labor Statistics reported that during the years of 1992-2001 annual employee absenteeism rates were between 1.9% and 2.3%. Current U.S. Bureau of Labor Statistics has reported absenteeism in educational services at 3%. The absences were based on those who worked an average of 35 hours per week or more (U.S. Bureau of Labor Statistics, 2006). Classroom teacher absences in the United States have not been specifically studied; however, principals responded that teacher absenteeism was a "moderate" problem on the National Center for Educational Statistics Schools and Staffing Survey (Strauss & Strauss).

As reported by Bruno (2002), another study, conducted in California, examined the relationship of teacher absences and the Academic Performance Index of 49 high schools in a Los Angeles public school district. This urban study included other variables such as establishing a relationship between teacher absenteeism and high income-low income geographic school locations. Disparities in school resources such as teacher attendance were noted. Schools with high teacher absenteeism had an Academic Performance Index of  $M = 505.74$ ,  $SD = 74.16$ . Schools with low teacher absenteeism had an Academic Performance Index of  $M =$

563.8,  $SD = 84.2$ . Of the 27 schools with high teacher absenteeism rates, 96% were located in low-income geographic locations (Bruno). These results indicated that schools with higher teacher absenteeism might have lower student achievement.

Bayard (2003) investigated the impact of teacher absenteeism on mathematics for students in middle and high schools during the 2001-2002 school year in Broward County, Florida. Her findings indicated that teachers who were absent more than 2 days had a small negative effect on student achievement scores in mathematics. Administrators must review teacher absences on a regular basis. Meeting with the teacher upon returning to work will help the administrator determine abuse of sick leave. Assisting new teachers in acclimating to the job will create a supportive atmosphere that could reduce absenteeism (Norton, 1998).

Teacher absenteeism has been a problem in other areas of the world. According to Reinikka and Smith (2004), the International Institute for Educational Planning (IIEP) helped launch a research project to address corruption in education. The project attempted to track public expenditures earmarked for education in developing countries. The Public Expenditure Tracking Survey (PETS) project was designed to curb leakage of public education funding in Peru, Uganda, and Zambia. The PETS project consisted of a research team that visited and tracked money flow from the source of monies down to the recipients. The recipients were schools, teachers, and students. Once PETS identified the leakage of funds, the government was responsible for implementing better accountability practices. Teacher absenteeism has been defined in some developing countries as “ghosts” on the payroll ledgers, including names of teachers who were no longer in the teaching service or who had never been employed as teachers. In 2000, Honduras showed 5% of “ghost” workers on the teachers’ payroll. In order to record accurate information, PETS project team members made surprise visits to schools to record teacher attendance. The PETS Project Teacher Attendance (see Appendix D) illustrates teacher absence rates in the public sector in participating countries (Reinikka & Smith).

Reinikka and Smith (2004) found that in Zambia, the PETS project was able to expand its scope by testing children in academic achievement. Test scores were collected for 2 consecutive

years to measure educational outcomes. Teacher absenteeism data were collected although specific data results were not reported in the study. The researchers concluded that teacher absenteeism had devastating effects on the academic achievement of the students. A child with a frequently absent teacher could fail to improve on any test score at all in an entire year. The findings from teacher absenteeism data indicated that absences were often due to illness or death rather than a lack of motivation to come to work. Teachers seemed to work harder to help students regain lost instructional time (Reinikka & Smith).

Duflo and Hanna (2005) focused on the tribal region of Udaipur, India and demonstrated that improving teacher attendance had a positive effect on student achievement scores. The project began in September 2003, with a baseline teacher absentee rate of 44%. Duflo and Hanna chose 120 schools to participate in the study; 60 schools were randomly chosen as the treatment group and the remaining 60 schools were assigned as the comparison group. This research project involved the distribution of cameras to the teachers in the treatment group. The teachers recorded their attendance by taking pictures of the students participating in instructional activities with the teacher 2 times per day. The cameras recorded the dates and times of the photographs. Teachers submitted the tamperproof cameras to project officials and teacher salaries were calculated from the recorded dates and times of the photographs. Over the 18 months of the program, the teacher absenteeism rate declined to 22% as compared to 42% in schools without cameras used to monitor the teacher absenteeism rate. Students in both groups were tested at the beginning of the phase of the project and again at the end of the project. Student achievement scores in the treatment group increased .17 standard deviations higher than did the achievement scores in the comparison group. During the 18 months of the project, teachers who participated in the treatment group taught an average of 54 more days per year, or about one third more days per month than did the comparison school group. Student absenteeism rates remained the same (Duflo & Hanna).



### *Teacher Examination Scores*

Any state receiving federal funds for education must comply with the *No Child Left Behind Act of 2001*. One of the requirements listed in this law is that teachers hired after the first day of school of the 2002-2003 school year must have earned at least a bachelor's degree, have full certification status, and demonstrate competency by passing a rigorous teacher examination. Nationwide, 10,000 perspective teachers failed a state administered teacher-qualifying exam in 2000-2001 (National Center for Educational Statistics, 2003).

During the years of 1977-1982, 16 states had passed legislation for state-sponsored qualifying teacher examinations. By 2002, 35 states required a passing score to receive full certification status. Teacher qualifying exams were introduced as a form of job analysis conceptualized by the business and industry sector (Watras, 2003). The National Teacher Exam (NTE), introduced in 1940, was a combination of questions derived from a task analysis of the teaching profession. As more states began to adopt teacher exam policies for certification, lawsuits citing discrimination came to the forefront. In 1975, a lawsuit was filed in North Carolina claiming that the state could not deny a teaching license to a prospective teacher who scored below 950 on the National Teacher's Examination. A U.S. District Court decision found that the test was arbitrary and discriminatory toward those persons who scored below 950. Teachers scoring lower than 950 could not be proven incompetent (400 F. Supp. 343, 1975 U.S. Dist. LEXIS). The decision was not upheld on the appeal. In 1981, three African American teachers filed a class action lawsuit against the Alabama State Board of Education claiming that the Alabama Initial Teacher Certification Testing Program discriminated against Black applicants (*Allen v. Alabama State Board of Education* 976 F. Supp. 1410). The results of that lawsuit put Alabama in a state sponsored testing dilemma until the adoption of the Praxis™ as the required teaching exam for certification (Watras, 2003).

The New York State Teacher Certification Examinations measure prospective teachers' knowledge and skills by administering the Liberal Arts and Science Test (LAST), the Teaching Theory and Practice test (ATS-W), and the content area of the Teacher's Certification area Test

(CST) (Burke, 2005). In 2003, over 3,300 African American and Latino teachers filed a lawsuit against the state claiming the certification exam was not indicative of their performance potential in the classroom. The plaintiffs also claimed discrimination because more minority teacher candidates failed the exam than did Caucasian teacher candidates. The Southern District Court of New York upheld the use of the LAST citing that there was no proof that the test was not valid. The defendants of the case easily proved job-relatedness without a formal investigation for validity (Burke, 2005).

The Equal Employment Opportunity Commission contributed guidelines applied by Educational Testing Service, prominent researchers, and publishers of standardized tests (Watras, 2003). The first guideline was that in court proceedings, the plaintiffs had to show that the testing procedure was discriminatory. A disproportionate amount of minorities or subgroups must have failed the test. The second guideline was that state departments of education could not defend the use of a teacher examination qualifying tests by showing how the test is job related and necessary to determine teacher qualifications. The third guideline was that plaintiffs could rebut by showing that other methods of evaluation would not have a discriminatory effect. With this information, Educational Testing Service conducted extensive research to eliminate discrimination when introducing the Professional Assessment for Beginning Teachers (Praxis) in 1993. The research participants included over 4,000 teachers and administrators in Georgia, California, and New Jersey. Special attention was given to ensure minority representation in determining the skills necessary for a beginning teacher during the job analysis. The participants in the research rated every teaching skill at every grade level in importance. The Praxis I measures academic skills, the Praxis II measures accomplishments in subject matter acquisition, and the Praxis III evaluates performance during classroom teaching (Watras).

Blue, O'Grady, Toro, and Newell (2002) conducted a study of predictive achievement on the Praxis I and II in Pennsylvania. The researchers compiled data from eight graduating classes from a college during the years 1994 and 2001. All 328 subjects majored in elementary education or early childhood education. Data collections included Scholastic Aptitude Test

(SAT) scores, grade point average (GPA) after 1 year, final GPA, and scores for seven Praxis tests. The Praxis tests included general knowledge, communication skills, professional knowledge, and principles of learning and teaching. After establishing a mean score for each individual test, standard deviation from the mean was calculated. From the standard deviation, scores were divided into three groups. The first group of scores fell within one standard deviation from the mean; the second group of scores fell one standard deviation or more above the mean; the third group of scores fell one standard deviation or more below the mean. The middle group comprised approximately 68% of the sample, while the high and low groups were each approximately 16% of the total. With .20 to .60 being considered a significant correlation range, results indicated a correlation of .69 between SAT scores and the General Knowledge test of the Praxis series and a correlation of .44 between total SAT score and final GPA. No significant relationships were found in the low group or the high group between SAT Math and Praxis test scores. Low to moderate correlations were found between the SAT Verbal and Praxis test scores. Significant correlations were found between final GPA and Praxis test scores for the high, middle, and total groups. No significant correlation was noted for the low group, with the exception of the Praxis Principles of Learning and Teaching test. In this study, the low group maintained its predictability throughout the statistical analysis. Blue et al. stated that this group could succeed when given opportunity but was often denied the teacher education program entrance.

Increasing teacher effectiveness has created much discussion on measuring subject matter knowledge; however, the link between the two is not as strong as predicted. According to Darling-Hammond (2000), research has produced mixed results in the area of measuring subject matter knowledge using standardized tests. Researchers conducting studies on the scores of the National Teacher Examinations have not found any consistent relationship between scores on the subject matter component and student achievement or principals' ratings of teachers (Darling-Hammond). It seems that subject matter knowledge is important up to a certain level but does not exceed the knowledge required for teaching a particular subject (Darling-Hammond).

Strauss and Vogt (2002) conducted another study analyzing teacher examination scores. The study, conducted in Pennsylvania, focused on two types of teacher proficiencies: general knowledge and pedagogical knowledge as measured by the National Teacher Examination (NTE) scores. The median score was obtained by using individual test results from any teacher employed in Pennsylvania between 1987-1999. The scoring results ranged from 250-990 and were produced in two areas: general knowledge and professional knowledge. The general knowledge portion of the test measured general background knowledge and basic skills and the professional knowledge portion measured pedagogy and psychology. Results indicated that teachers with a higher general knowledge NTE score had a very large effect on the composite measure of student achievement with an estimated elasticity of 12.66. Teachers with a higher score on the professional knowledge portion of the NTE exam had a negative but statistically insignificant effect on composite measures of student achievement (Strauss & Vogt).

Recent studies using Praxis scores of teacher assessment have demonstrated an attempt to predict teacher effectiveness. A study conducted in South Dakota examined the scores on the Praxis Principles of Learning and Teaching test in comparison with administrators' ratings of 1st-year teachers (Rogness, 2005). Beginning teachers who had completed their teacher education program at South Dakota State University were located and their immediate administrator was asked to complete a questionnaire on effectiveness. The administrator rating scale was based on responses from 1 to 5 on a 44-item instrument. The items were grouped into 10 categories based on the Interstate New Teacher Assessment and Support Consortium (INTASC). At the time of the study, South Dakota had not established a cut score for the Praxis II teacher examination. The score of 161 was determined to differentiate high and low scores, which was the median of all existing state cut scores for teacher certification at the time of the study. Using the Pearson product moment correlation, no significant relationship existed between Praxis II Principles of Learning and Teaching test scores and administrator ratings of 1st-year teachers (Rogness).

Another study conducted in Tennessee analyzed the Praxis II Reading Across the Curriculum test scores of 64 teacher education candidates and the candidates' performance in their student teaching practicum (Smith, 2006). Other data collected to predict student teaching performance and scores on the Praxis II Reading Across the Curriculum included ACT or SAT scores, Praxis I scores in reading, math, and writing, disposition assessments, grade point averages in literacy-related coursework, number of clock hours completed in field experiences, and grade point averages prior to admission to the teacher education program and prior to student teaching semester. At the time of this study, no cut score had been established for the Praxis II Reading Across the Curriculum test, although the mean score of 170.25 ( $SD=10.25$ ) was the result of the final analysis. The Student Teacher Final Evaluation rubric addressed the following domains: planning, teaching strategies, assessment and evaluation, learning environment, professional growth, and communication. A composite score was received after two student teaching experiences. The mean score of 2.67 ( $SD=.27$ ) was identified as the result of the final analysis of the Student Teacher Final Evaluation rubric. A multiple regression method was used to identify the best predictor variable of each of the two criterion variables. Results of this study indicated that the grade point average of literacy-related coursework was the greatest predictor of the teacher candidates' performance on the Praxis II Reading Across the Curriculum test and the Praxis I Math scores was the most reliable source of the teacher candidates score on the Student Teacher Final Evaluation rubric (Smith).

A study conducted in Maryland, associated with student achievement, includes results of Praxis II Mathematics scores of teachers currently employed in Lower Eastern Shore of Maryland school districts (Vail, 2005). The purpose of the study was to compare 31 middle school mathematics teachers' route to obtaining "highly qualified" status and student achievement as measured by the Maryland School Assessment (MSA). MSA mathematics scores were collected from 2,818 students in grades six, seven, and eight who were taught by the selected 31 teachers. Teacher demographics were obtained through a written survey. Demographic data included content training, years of experience, certification type, endorsement

areas, educational degree level, and other demographics. Teachers' routes to highly qualified status were divided into three categories. The first category was those teachers obtaining highly qualified status through a graduate or undergraduate major in mathematics; the second category was those teachers obtaining highly qualified status through the high objective uniform state standard of evaluation (HOUSSE); and the third category was those teachers obtaining highly qualified status through the Praxis II Mathematics test. The statistical analyses include descriptives, analyses of variance (ANOVA), regression analysis, and analysis of covariance (ANCOVA). According to Vail, results indicated that mathematics test scores on the MSA of students of mathematics teachers obtaining highly qualified status through HOUSSE methods scored as well as students whose teachers obtained highly qualified status through a graduate or undergraduate degree in mathematics. Students whose teachers obtained highly qualified status through the Praxis II Mathematics test scored significantly lower than other students on the MSA ( $F(3,2737) = 9.181, p < .001$ ). Students whose teachers had a master's degree in any educational field area scored significantly higher than did students whose teachers had either more or less educational degree level  $F(3,2781) = 20.993, p < .001$ ). These results indicated that the Praxis II Mathematics test might not be a good indicator of student success on the Maryland Student Assessment (Vail).

### *Years of Experience*

Darling-Hammond (2000) noted that the relationship between student achievement and years of experience was not always significant or linear. She acknowledged earlier studies that established inexperienced teachers with fewer than 5 years of experience were less effective than more experienced teachers. However, after about 5 years, the effect seemed to wane. Darling-Hammond said possible reasons for this curvilinear effect could have been the advancement of 5-year teacher education programs that enabled teachers to participate in a full year of teaching experience while gaining master's degree credits. She added these programs might produce a more confident, skilled teacher. Another reason for the trend could have been the hiring of

groups of teachers during a teacher shortage period. These groups could have been less qualified and produced a less qualified, older teacher cohort. Darling-Hammond pointed out the study of years of teaching experience was often unclear because of its natural correlation with age, postsecondary level of degrees, and status of certification.

Another study conducted at Duke University compiled data from the North Carolina Education Research Data Center (Clotfelter, Ladd, & Vigdor, 2004). This study notated the difficulty in providing a causal relationship between teacher characteristics and student achievement. This study did attempt to control other variables such as teacher sorting and teacher shopping within school districts. According to this document, the practice of teacher sorting and teacher shopping has been frequently demonstrated in districts to produce higher test scores. The practice assigns the highest qualified teachers with the most able students while the least qualified teachers are assigned to the least capable students. Therefore, efforts were made to include only schools that randomly assign students to classrooms. Teacher licensure test scores and years of experience yielded the most significant returns in relation to student achievement. A variable created for teacher licensure test scores allowed conversion of test scores from different administrations to standardized scores using means and standard deviations. Years of experience were counted for the total number of years credited by the state. According to Clotfelter et al., results indicated that teachers with the lowest test scores on licensure exams tended to teach in the classrooms that had below average student achievement scores, below average percentages of White students, and below average numbers of students with college-educated parents. The least experienced teachers tended to teach in classrooms with below average student achievement scores and below average number of college-educated parents. The least experienced teachers also tended to have degrees from the least competitive colleges according to Barron's ranking of competitive colleges (Clotfelter et al.).

According to Berliner and Biddle (1995), Berliner, coauthor of *The Manufactured Crisis: Myths, Fraud, and the Attack on America's Public Schools*, stated that it takes 5 to 8 years to become a master teacher. Berliner and Scherer (2001) attributed this competence to case

knowledge accumulated from field experience. Teachers with experience can reach into their memory banks to figure out answers to complex classroom situations. These experienced teachers have stored memory banks filled with similar situations that can be applied to new learning problems, new textbooks, and new curriculums. Experienced teachers are better at capturing teachable moments in the day-to-day flow of instruction. Novice teachers have limited stored memory to use as a resource to facilitate the learning process (Berliner & Scherer).

According to Sion (2005), teachers with multiple years of experience possess attributes that may appear later in time that indirectly relate to student achievement. Teachers with many years of experience have described themselves as secure, confident, and reaching a level of self-actualization. Sion pointed out that experienced teachers are comfortable asking questions, debating with colleagues, and accepting differing viewpoints on pedagogical theory. They relate stories of how teachers affect the lives of the students encountered over the course of their career. These characteristics are often conducive to a comfortable learning environment for students (Sion).

Changes in the organizational structure of the educational system or reform efforts have been found to produce anxiety in inexperienced teachers. Smith, Hall, and Woolcock-Henry (2000) described the urgency of the *School-To-Work Opportunities Act of 1994* and the *Perkins Act of 1988* requiring districts to be more accountable for student performance. These acts are designed to promote collaboration between educator and employers in preparation of a highly skilled workforce. As with any reform, a positive attitude in meeting federal and state mandates is necessary to enhance student performance. Smith et al. measured the effects of years of experience and explanatory style of responses on 219 secondary vocational teachers in Georgia. Explanatory style was defined as “attributing negative events to external (someone else), unstable (short-lived), and specific (not pervasive) causes rather than internal, stable, and global causes” (Smith et al., p. 5). Years of experience were grouped as 1 to 10 years, 11 to 22 years, and 21 years and over. Results indicated that teachers were more optimistic in the 11 to 20 years of experience range. The researchers stated that the level of optimism reflected better adjustment



to federal mandated changes and those teachers would embrace changes as a challenge (Smith et al.).

Luekens, Lyter, and Fox (2001) completed a study on teacher attrition and mobility to determine where experienced teachers go and why they leave. The Luekens et al. study began with the 1999-2000 Schools and Staffing Survey (SASS) that extracted 8,400 teachers to participate in the Teacher Follow-up Survey 1 year later. The survey response rate was 90% with the number of teachers leaving the profession totaling 2,800. The researchers asked the “leavers” to identify the reasons why they left teaching in order to help school districts to examine policies for teacher retention. Of the school leavers, 27% responded on the 1999-2000 SASS survey that they intended to stay in the profession as long as they were physically able to teach. The teachers who left were asked to submit their reasons for leaving. Retirement was the response of 29% of the leavers. Leaving to begin another career with better pay was the response of 20% of the leavers. More women than men reported leaving because of health related issues. More men than women left to begin careers with more pay. Of the public school leavers, 50% of African Americans reported that retirement was a very important reason to leave the profession in comparison with Caucasian counterparts at 28%. Public school teachers who left to begin careers with more pay included 44% African American public school teachers and 17% Caucasian public school teachers. About 20% of public school leavers continued to work in the school district in 2000-2001. Those reporting working for the government the following year included 23% of both public and private school leavers. The leavers who were newly employed elsewhere were asked to compare their current job satisfaction with their job satisfaction while employed in public or private schools. Current job satisfaction was listed as better than school employment on 15 of the 17 job satisfaction indicators. Leavers cited their current position as being better in size of the workload, more opportunities for professional advancement, recognition, and general working conditions (Luekens et al.).

Kleckler and Loadman (1997) conducted a study involving 10,544 teachers in 307 schools in Ohio. The schools chosen were all in the process of restructuring through a grant program

called Venture Schools. The teachers completed the National Follow-up Survey of Teacher Education Graduates. This survey measured job satisfaction in seven areas: salary and benefits, opportunities for advancement, level of challenge, level of autonomy, general working conditions, collaboration with colleagues, and interaction with students. Teachers were grouped by years of experience: 5 years or fewer, 6-10 years, 11-15 years, 16-20 years, 21-25 years, and 26 years or more. One-way ANOVAs found no statistical significance in years of experience and job satisfaction with salary, general working conditions, or interaction with students. Teachers with 5 or fewer years of experience rated job satisfaction higher on opportunities for advancement, level of challenge, autonomy, and total score. Teachers consistently rated general working conditions as least favorable and student interaction as most favorable on the job satisfaction indicators. The results of this study differed from the notion that teachers with fewer than 5 years of experience left the profession because of lack of job satisfaction (Klecker & Loadman).

The probability that teachers will transfer to other schools or exit the teaching profession was studied applying data from the Texas Schools Project, the Texas Education Association, Public Education Information Management System, and the Texas Assessment of Academic Skills. Hanushek, Kain, and Rivkin (2001) conducted the study to investigate the effects of salary and other school factors on teacher mobility. Teachers were divided into years of experience, school and community type, and race. Annually, between 1993 and 1996, 79% of teachers remained in the same school, 14% exited the teaching profession, 4% transferred to another school within the district, and 3% switched districts. Results indicate that teachers with less experience (0 – 2 years) exited the teaching profession at a higher rate than did teachers with more experience (11 – 30 years). Less experienced teachers were more likely to improve their salaries when transferring to another district than more experienced teachers were when transferring to another district. Analysis of school demographics and socioeconomic status and teacher mobility indicated that teachers prefer moving into high achieving, low minority, and average socioeconomic status schools, whether urban or suburban. Results indicated that

Caucasian teachers prefer Caucasian students while African American and Hispanic teachers prefer African American and Hispanic students. Hanushek et al. inferred that this statistical outcome could be part of the difficulty in teacher retention in urban areas with high minority student populations.

The 1994 National Assessment of Educational Progress (NAEP) documented students' reading achievement in relation to teacher variables and professional development. Teachers who were fully certified, had master's degrees, and had participated in professional learning opportunities on literature-based instruction were more effective in raising students' reading achievement scores than were teachers who did not have these characteristics. Teachers with more professional training were more likely to develop a richer program by integrating use of the library, reading and writing curriculum units, motivational trade books, and a wider variety of literature and were less likely to use basal readers, worksheets, and multiple choice tests (Darling-Hammond, 2000).

The relationship between mathematics achievement scores and years of experience of the teacher was documented in a study by Klecker (2002) using the 2000 National Assessment of Educational Progress mathematics scores of eighth graders enrolled in public schools in Kentucky, Tennessee, and Texas. The years of experience grouping variable was divided into 2 years or less, 3 to 5 years, 6 to 8 years, 8 to 10 years, 11 to 24 years, and 25 or more years. The student achievement scores were extracted from the 2000 National Assessment of Educational Progress (NAEP) mathematics mean scores of fourth and eighth graders. The variable years of experience was determined by the responses on the NAEP question that asked the teachers to indicate the number of years teaching mathematics, counting the current year. The results indicated that students with teachers who had more years of experience teaching mathematics scored higher on the mathematics examination. However, the effect was in the .34 to .37 range, which is considered small. Klecker also noted the limited amount of variance of categories in the study. She stated that reforms in teaching mathematics might be working.

Felter (2001) iterated the notion that teachers of mathematics should have a strong background in their subject area to raise effectively students' achievement scores. In California, teacher preparation programs in mathematics require 30 semester units that encompass algebra, geometry, calculus, number theory, mathematics systems, statistics and probability, and the history of mathematics. Using the 1998 California Basic Educational Data System (CBEDS) and the 1998 Professional Assignment Information Form, the Felter integrated these data to compare results of teacher degree levels, years of teaching, student participation, student poverty level, and number of teachers on emergency permits. Student achievement scores were measured by the SAT-9.

Felter's (2001) results indicated that schools with well-prepared mathematics teachers defined by the number of years of experience had higher student mathematics scores whether measured by the educational level index or the emergency waiver total count. Schools with more poverty tended to have teachers with less experience and lower test scores. Unfortunately, according to Felter, as teachers gain seniority and experience, they often transfer out of less desirable low performing schools to higher achieving schools.

Research recently conducted by the Southwest Educational Development Laboratory in Austin, Texas (Jones, Alexander, Rudo, Pan, & Vaden-Kiernam, 2006), analyzed teaching experience in reading and mathematics in grades four and eight as a part of a study of teacher resources and student achievement in high-needs schools in Texas, Arkansas, and Louisiana. While controlling for prior year achievement, regressed mean school scores for fourth- and eighth-grade math and reading scores were the variables of interest. In Arkansas, there was no statistical significance in teaching experience in predicting scores in reading or mathematics in grades four and eight. However, the level of student minority enrollment, student poverty, and average median household income were all negatively associated with math achievement. In the eighth-grade math analysis, parent education level had a positive and significant contribution to math achievement. In Louisiana, a regression analysis of fourth-grade math achievement on the Louisiana LEAP 21 exam revealed a significant effect for teaching experience and its squared

term. The finding for teaching experience (squared term) revealed that for every 1-year increase above the school average of 13 years of experience, math scores decreased by .24 scaled score points. In the regression analysis of Louisiana eighth-grade math achievement scores, teaching experience was again a significant predictor. However, for every 1-year increase in experience above the 13-year average, student math achievement scores increased by .046 scaled score points. With the inclusion of teacher experience and minority student enrollment, the overall summary of the model explained 59% of the variance,  $F(13,112) = 15.071, p < .001, R^2 = .59$ . In Texas, the Texas Learning Index student achievement scores indicated that a 1-year increase beyond the average years of teaching experience of 12 years, increased fourth-grade student math achievement scores by .011 points. In the eighth-grade math analysis, teaching experience appeared to produce a negative effect on eighth-grade math achievement. In reading, Arkansas results indicated that teaching experience had a significant and negative effect on fourth-grade reading achievement. When teaching experience was above the average of 12.5 years of teaching experience, the schools' average fourth-grade reading achievement scores on the Arkansas Benchmark exam decreased by .09 scaled score points. With the inclusion of the variables of teacher salary, teaching experience and its squared term, traditional certification, student minority enrollment, and student poverty, the model explained 56% of the variance in fourth-grade reading achievement,  $F(14,501) = 47.169, p < .001, R^2 = .56$ . Arkansas Benchmark exam scores for eighth-grade reading scores were not included in this study. In Louisiana, teacher experience was the only variable that contributed significantly to the prediction of fourth-grade reading scores. The results indicated that for every year of teaching experience above the average of 13 years, the average school reading achievement score for fourth-grade reading increased by .16 scaled score points, controlling for other variables. Regression scores for the full model including teaching experience and its squared term, standard certification, instructional expenditures per pupil, and student poverty explained 75% of the fourth-graders' reading achievement,  $F(14,753) = 164.782, p < .001, R^2 = .75$ . Eighth grade scores of reading achievement for Louisiana were not included in this study. In Texas, teacher experience and its

squared term were significant in the prediction of fourth-grade reading achievement scores. In schools where years of teacher experience was above the average of 12 years, the average fourth-grade reading achievement scores decreased by .035 Texas Learning Index points while controlling for other variables. Teaching experience and parent education significance accounting for the full model explained 44% of the variance in fourth-grade reading achievement,  $F(13,314) = 20.690, p < .001, R^2 = .44$ . Teacher experience was not a significant variable in eighth-grade reading achievement scores. In cross-state findings, teacher experience was inconsistent; Jones et al. attributed this to a lack of reliable data. In Arkansas and Texas, teacher experience was negatively related to student achievement. In Louisiana, teacher experience was positively related to student achievement (Jones et al.).

### *Summary*

The purpose of this study was to determine if there is a relationship between teacher variables and the Tennessee Comprehensive Assessment Program annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee. The teacher variables in this study were days absent, Praxis II Principles of Learning and Teaching scores, and years of experience. When attempting to establish a relationship between teacher variables and student achievement, it is important to remember that teacher variables can overlap and distort results.

According to Strauss and Strauss (2003), principals reported teacher absenteeism rates as a moderate problem in the National Center for Educational Statistics Schools and Staffing Survey. Strauss and Strauss pointed out, in comparison with the U.S. Bureau of Labor Statistics 1992-2001 average annual absenteeism rate (between 1.9% and 2.3%), that teacher absenteeism rates appeared high when considering the number of working days in a teacher's contract. However, the effect has been generally moderate.

Results from research conducted on the use of teacher licensing exams as an indicator of competence were mixed and the cultural objectivity of the exams have been challenged in court.

The use of the Praxis scores as a measure of teacher effectiveness has not been conclusive and the correlation between Praxis scores and student achievement in reading has not been significant.

Research concerning years of experience can be misleading. Variables such as advanced degree level, age, certification status, changes in school assignments, and student demographics could convolute data results. There is a positive correlation between years of experience and student achievement scores in mathematics up to a certain number of years. The strength of the correlation often waned beyond 12 to 13 years of experience.

Chapter 3 includes six research questions that guide the data collection for this study in Hamblen County, Tennessee. The statistical analysis is described, as well as the population, procedures, and instrumentation used for the study.

## CHAPTER 3

### METHODS AND PROCEDURES

The purpose of this study was to determine if a relationship exists between teacher variables and the Tennessee Comprehensive Assessment Program annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee. The teacher variables in this study were (a) absenteeism, (b) teacher examination scores, and (c) years of teaching experience. This chapter describes the research design, null hypotheses, population, data collection methods, and method of data analysis.

#### *Research Design*

This study was a quantitative, comparative research design to examine the relationships between student achievement test scores (criterion referenced raw scores) in reading and mathematics and teacher variables. I examined the raw scores of students participating in the 2006-2007 Tennessee Comprehensive Assessment Program in reading and mathematics in grades three through eight and 2006-2007 data concerning teacher variables. The teacher variable data consisted of the number of days absent for the 2006-2007 school year, the Praxis II Principles of Learning and Teaching (PLT) teacher examination scores, and the years of teaching experience. All data used in this study were extant and not intended to prove cause-and-effect results. Any relationships resulting from analyses were tentative. The teacher absenteeism data were analyzed by applying the Pearson correlation coefficient. Assumptions of the correlation coefficient included variables that are normally distributed and independent of each other. The Praxis II PLT teacher examination score data were analyzed using a *t* test for independent samples. The assumptions of these data included that the scores formed an interval scale of measurement, were normally distributed, and that the score variances were equal. A two-tailed test of significance was applied to these measures. The years of experience data were analyzed



by using an analysis of variance (ANOVA) to compare between-group variance and within-group variance. The alpha level selected for rejection or retention of the null hypotheses prior to data collection was set at .05 (Gall et al., 2003).

### *Research Questions and Hypotheses*

The following research questions and null hypotheses are presented for this study:

1. Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?  
Ho1: There is no relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight.
2. Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?  
Ho2: There is no relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight.
3. Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?  
Ho3: There is no relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight.
4. Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP Achievement test annual scores in mathematics of students in grades three through eight?

- Ho4: There is no relationship between teachers' Praxis II Principles of Learning and Teaching and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight.
5. Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?
- Ho5: There is no relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight.
6. Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?
- Ho6: There is no relationship between years of teaching experience and 2006-2007 TCAP achievement annual scores in mathematics of students in grades three through eight.

### *Research Population*

The participants of this study were selected through a nonprobability sampling of 187 teachers of reading and mathematics for students in grades three through eight. All teacher participants were employed in the Hamblen County school district and assigned to 1 of 11 kindergarten through fifth-grade elementary schools or 4 sixth- through eighth-grade middle schools for the 2006-2007 school year. Special education teachers who submitted fewer than 10 TCAP student achievement test scores were excluded from this study. Teachers included in this study have contract negotiations that include 10 sick leave days per year, 2 personal leave days per year, and 3 compensatory leave days per year. Sick days were defined as days absent for personal or family illness. Personal days are days absent for unforeseen emergencies not related to illness. Compensatory days are defined as days worked overtime for school related functions. All three types of leave days were considered absences from classroom instructional time.

Teachers participating in extended leave exceeding 20 school days were excluded from this study. Years of experience data were recognized as vested years of experience by the Tennessee Department of Education. All teacher participants administered the Tennessee Comprehensive Assessment Program test in reading and mathematics or both depending on grade level taught during the aforementioned school year. Teachers in grades three through five may teach both reading and mathematics. Teachers assigned to middle schools are departmentalized, teaching only reading or mathematics. Teacher participants have met all criteria for full licensure to teach in the state of Tennessee. Permission from the director of schools was requested for data access (see Appendix A). All participants and student scores were coded for confidentiality. The teacher participant data for this study were located at the central office in the school district.

### *Instrumentation*

The instrumentation for this study was extant data retrieved from the Hamblen County Department of Education central office. Student achievement test scores in reading and mathematics were generated from the Tennessee Comprehensive Assessment Program (TCAP) published by CTB McGraw Hill. The content validity of the test is established by the alignment of the content domains addressed in the test in relation to the score results. Test reliability for the TCAP test in reading and mathematics ranges from .90 to .93 (Tennessee Department of Education, 2006). The relationship between teacher absenteeism and student achievement scores was determined by a correlation coefficient for quantitative data. The value of  $r$  supplies information on the direction of the relationship and its relative strength. The correlation coefficient will not provide information to establish a cause-effect relationship but could suggest the consideration of other factors contributing to the relationship. The Praxis II Principles of Learning and Teaching (PLT) became a requirement for teacher licensure in the state of Tennessee in 1993. All teacher-participants' Praxis II PLT scores included in this study were administered by the Praxis II PLT for grades K–6. The median score for the Praxis II Principles of Learning and Teaching for grades K-6 is 174. The median score for each test was the division

point in determining the two groups (above or below median score). Teachers with median scores were included in the above grouping (Educational Testing Service, 2007). The years of experience were grouped in 5-year increments similar to studies conducted by Klecker and Loadman (1997).

### *Procedures*

Permission for access to student achievement scores from the Tennessee Comprehensive Assessment Program administered in 2006-2007 was requested and granted from the Director of Schools in Hamblen County, Tennessee. Permission to access teacher personnel files to retrieve Praxis II PLT teacher examination scores was requested and granted from the Director of Schools in Hamblen County, Tennessee. Permission to access years of experience, as well as days absent for the 2006-2007 school year from the business department was requested and granted from the Director of Schools in Hamblen County, Tennessee (see Appendix A). All teacher participant data and student scores were coded to maintain confidentiality. Permission from the East Tennessee State University Institutional Review Board was requested for data collection of student achievement scores and teacher variables. The East Tennessee State University Institutional Review Board determined that this study did not fall under the purview of the ETSU Veteran's Administration Institutional Review Board and did not require IRB approval.

### *Data Analysis*

The predictor variables labeled teacher variables were analyzed using the Statistical Package for the Social Sciences. A correlation coefficient determined if a relationship exists between teacher absenteeism and student achievement test scores. This linear relationship assumes that the variables are bivariate normally distributed and independent of each other. An independent samples *t* test was used to assess median score groupings for the predictor variable Praxis II PLT teacher examination scores (above or below median score). The testing

variable data were grouped into above or below median scores when analyzing TCAP scores in reading and mathematics. The ANOVA statistical analysis was applied to the variable of years of teaching experience (low = 0 through 5 years of experience, middle = 6 through 10 years of experience, and high = more than 10 years of experience).

Teacher participant data and student achievement scores were grouped by grade levels and the subjects taught (reading or mathematics). The identity of specific teachers and students was protected by assigning a code associated with the teacher and grade level, subject taught (reading and mathematics), and corresponding student achievement scores.

Approximately 4,180 student test scores were used in this study. The test scores are the results of the Tennessee Comprehensive Assessment Program (TCAP-CRT) criterion-referenced test for reading and mathematics for students in grades three through eight administered each spring. Using the district's software program for data grouping, TestMate Clarity, a mean average for student raw scores for grades three through eight in reading and mathematics was compiled.

The software program Testmate Clarity allows the user to disaggregate data from the test scores of large groups of students. A criterion-referenced test measures the amount of content acquired by the student being assessed. Results are compared to a set of criteria chosen for the content area rather than other students' results. In this study, individual student's raw scores in reading and mathematics were compiled into subgroups according to a teacher identification system. Using the Group Subtest Report, each student's performance in reading and mathematics was analyzed using the criterion referenced raw score (CTB/McGraw-Hill, 2000).

### *Summary*

Chapter 3 described the methodology chosen for this study. The research design was explained and the research questions and null hypotheses were presented. The research population, instrumentation, data analysis, and procedures were described. Chapter 4 presents the statistical analysis of the collected data.

## CHAPTER 4

### ANALYSIS OF DATA

This chapter contains the results of the findings related to the six research questions proposed in Chapters 1 and 3. The purpose of this study was to determine if a relationship exists between teacher variables and the Tennessee Comprehensive Assessment Program (TCAP) student annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee. The teacher variables were days absent, Praxis II scores, and years of experience. The data for the teacher variables were all collected at the Hamblen County Department of Education for the 2006-2007 school year. The Tennessee Comprehensive Assessment Program test scores were collected for the 2006-2007 school year for students in grades three through eight. Chapter 4 is guided by six research questions and associated null hypotheses.

#### *Analysis of Research Questions*

##### *Research Question #1*

Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?

A Pearson correlation coefficient was used to determine if there was a relationship between the number of days absent and TCAP achievement scores in reading.

H<sub>01</sub>: There is no relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight.

A Pearson correlation coefficient was computed for teachers' days absent and third grade TCAP achievement scores in reading. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in third grade ( $M = 46.14$ ,  $SD = 4.33$ ). The correlation between teachers' days absent and third grade TCAP

achievement scores in reading was not significant,  $r(38) = -.08, p = .62$ . Therefore, the null hypothesis Ho1 regarding third-grade reading scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and fourth grade TCAP achievement scores in reading. The results of the correlational analysis revealed a positive relationship between teachers' days absent and TCAP achievement scores in fourth grade ( $M = 48.68, SD = 4.72$ ). The correlation between teachers' days absent and fourth grade TCAP achievement scores in reading was significant,  $r(31) = .40, p = .02$ . Therefore, the null hypothesis Ho1 for fourth-grade reading scores was rejected.

A Pearson correlation coefficient was computed for teachers' days absent and fifth grade TCAP achievement scores in reading. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in fifth grade ( $M = 43.37, SD = 5.19$ ). The correlation between teachers' days absent and fifth grade TCAP achievement scores in reading was not significant,  $r(33) = -.15, p = .40$ . Therefore, the null hypothesis Ho1 for fifth-grade reading scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and sixth grade TCAP achievement scores in reading. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in sixth grade ( $M = 42.82, SD = 9.85$ ). The correlation between teachers' days absent and sixth grade TCAP achievement scores in reading was not significant,  $r(25) = -.11, p = .57$ . Therefore, the null hypothesis Ho1 for sixth-grade reading scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and seventh grade TCAP achievement scores in reading. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in seventh grade ( $M = 43.44, SD = 7.64$ ). The correlation between teachers' days absent and seventh grade TCAP achievement scores in reading was not significant,  $r(22) = -.10, p = .63$ . Therefore, the null hypothesis Ho1 for fifth-grade reading scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and eighth grade TCAP achievement scores in reading. The results of the correlational analysis revealed a weak relationship between teachers' days absent and TCAP achievement scores in eighth grade ( $M = 39.35$ ,  $SD = 8.90$ ). The correlation between teachers' days absent and eighth grade TCAP achievement scores in reading was not significant,  $r(26) = .05$ ,  $p = .92$ . Therefore, the null hypothesis Ho1 for eighth-grade reading scores was retained.

### *Research Question #2*

Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

A correlation coefficient was used to determine if there is a relationship between the number of days absent and TCAP achievement scores in mathematics.

Ho2: There is no relationship between teachers' days absent and 2006-2007 TCAP achievement test scores in mathematics of students in grades three through eight.

A Pearson correlation coefficient was computed for teachers' days absent and third grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in third grade ( $M = 51.88$ ,  $SD = 4.64$ ). The correlation between teachers' days absent and third grade TCAP achievement scores in mathematics was not significant,  $r(38) = -.10$ ,  $p = .56$ . Therefore, the null hypothesis Ho2 for third-grade mathematics scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and fourth grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak relationship between teachers' days absent and TCAP achievement scores in fourth grade ( $M = 48.66$ ,  $SD = 4.04$ ). The correlation between teachers' days absent and fourth grade TCAP achievement scores in mathematics was not significant,  $r(31) = .26$ ,  $p = .15$ . Therefore, the null hypothesis Ho2 for fourth-grade mathematics scores was retained.



A Pearson correlation coefficient was computed for teachers' days absent and fifth grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in fifth grade ( $M = 44.33$ ,  $SD = 5.10$ ). The correlation between teachers' days absent and fifth grade TCAP achievement scores in mathematics was not significant,  $r(33) = -.11$ ,  $p = .52$ . Therefore, the null hypothesis Ho2 for fifth-grade mathematics scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and sixth grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in sixth grade ( $M = 42.19$ ,  $SD = 8.07$ ). The correlation between teachers' days absent and sixth grade TCAP achievement scores in mathematics was not significant,  $r(25) = -.14$ ,  $p = .50$ . Therefore, the null hypothesis Ho2 for sixth-grade mathematics scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and seventh grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak negative relationship between teachers' days absent and TCAP achievement scores in seventh grade ( $M = 45.70$ ,  $SD = 8.51$ ). The correlation between teachers' days absent and seventh grade TCAP achievement scores in mathematics was not significant,  $r(22) = -.12$ ,  $p = .57$ . Therefore, the null hypothesis Ho2 for seventh-grade mathematics scores was retained.

A Pearson correlation coefficient was computed for teachers' days absent and eighth grade TCAP achievement scores in mathematics. The results of the correlational analysis revealed a weak relationship between teachers' days absent and TCAP achievement scores in eighth grade ( $M = 40.04$ ,  $SD = 9.59$ ). The correlation between teachers' days absent and eighth grade TCAP achievement scores in mathematics was not significant,  $r(27) = .02$ ,  $p = .94$ . Therefore, the null hypothesis Ho2 for eighth-grade mathematics was retained.

### *Research Question #3*

Is there a relationship between teachers' Praxis II Principles of Learning and Teaching (PLT) scores and 2006-2007 achievement test annual scores in reading of students in grades three through eight?

An independent samples *t* test was used to determine if there is a relationship between the Praxis II scores and TCAP achievement scores in reading. The Praxis II PLT for grades kindergarten through six has a possible score range of 100–200 with a median score of 174. Table 1 shows the mean scores for the Praxis II PLT for grades kindergarten through six.

Table 1

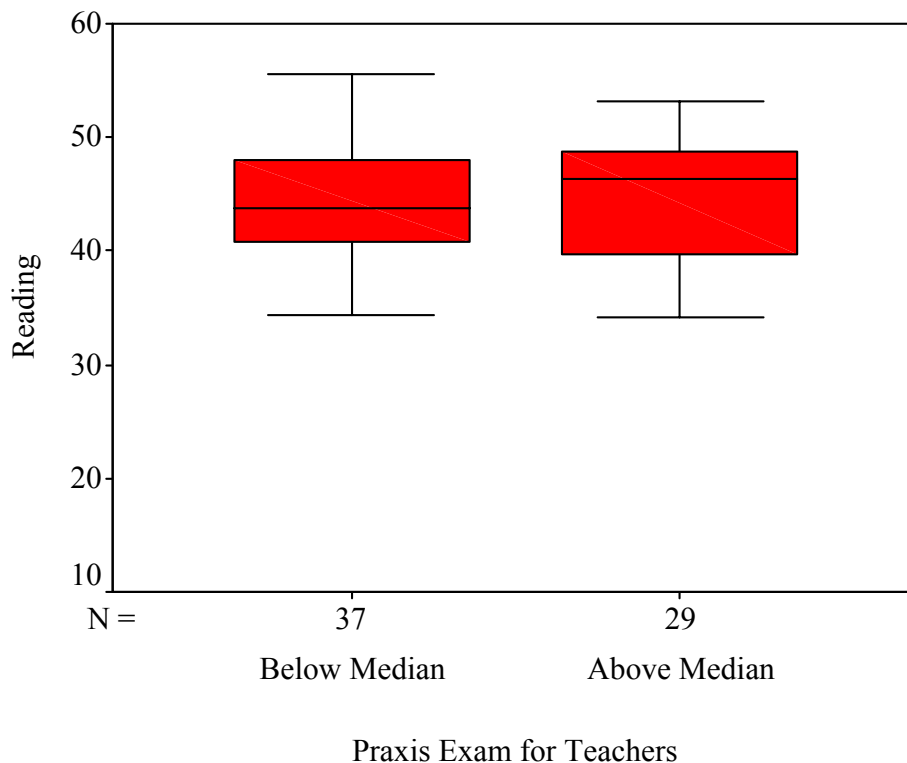
*Praxis II Principles of Learning and Teaching Mean Scores*

Praxis Exam	<i>N</i>	<i>M</i>	<i>SD</i>
Below Median	37	167.30	4.86
Above Median	29	180.24	4.70
Total	66	172.98	8.03

Ho3: There is no relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement test Annual scores in reading of students in grades three through eight.

An independent-samples *t* test was conducted to determine if there is a relationship between teachers' Praxis II Principles of Learning and Teaching mean scores above or below median and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight. The TCAP mean score was the test variable and the grouping variable was

above or below median Praxis II Principles of Learning and Teaching score. The test was not significant,  $t(64) = .47, p = .64$ . Therefore, the null hypothesis  $H_{o3}$  was retained. The  $\eta^2$  index was  $< .01$ , which indicated a small effect. The mean TCAP reading scores for teachers with Praxis II scores above the median ( $M = 44.12, SD = 6.27$ ) was similar to the mean TCAP reading scores for teachers with Praxis II scores below the median ( $M = 43.32, SD = 7.31$ ). The 95% confidence level for the difference in means was -2.60 to 4.21. Figure 1 shows the distribution of the reading scores for the two groups.



*Figure 1.* Boxplot for Praxis II Principles of Learning and Teaching Scores and TCAP Achievement Scores in Reading for Students in Grades Three Through Eight

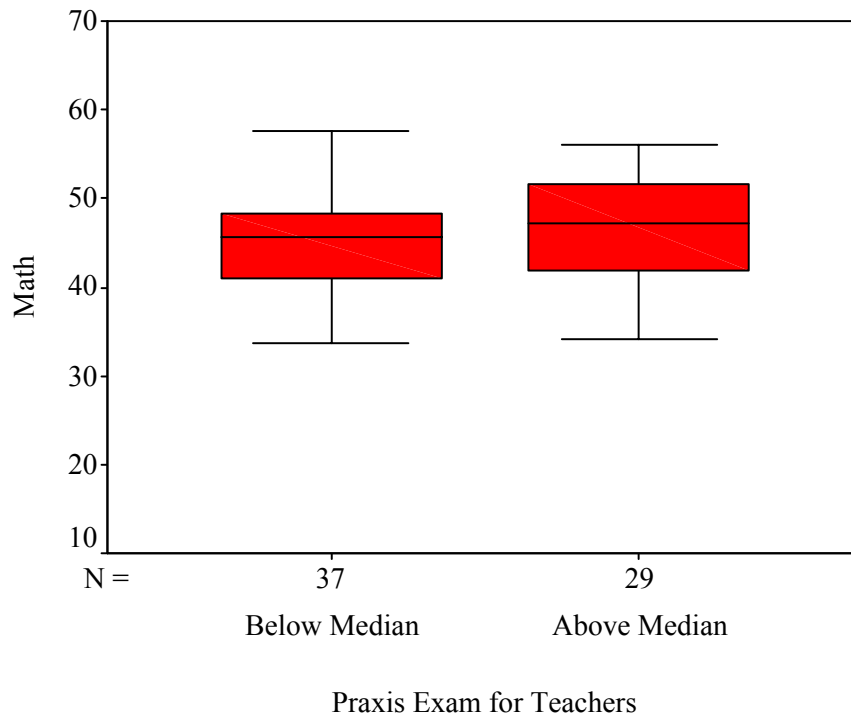
#### *Research Question #4*

Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

An independent samples  $t$  test was used to determine if there is a relationship between Praxis II scores and TCAP achievement scores in mathematics.

Ho4: There is no relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP achievement annual scores in mathematics of students in grades three through eight.

An independent-samples  $t$  test was conducted to determine if there is a relationship between teachers' Praxis II Principles of Learning and Teaching mean scores above or below median and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight. The TCAP mean score was the test variable and the grouping variable was above or below median Praxis Principles of Learning and Teaching score. The test was not significant,  $t(64) = .80, p = .43$ . Therefore, the null hypothesis Ho4 was retained. The  $\eta^2$  index was .01, which indicated a small effect. The mean mathematics scores for teachers with Praxis II scores above the median ( $M = 46.25, SD = 6.73$ ) was similar to the mathematics mean of teachers with Praxis II scores below the mean ( $M = 44.74, SD = 8.21$ ). The 95% confidence level for the difference in means was -2.25 to 5.27. Figure 2 shows the distribution of the mathematics scores between the two groups.



*Figure 2.* Boxplot for Praxis II Principles of Learning and Teaching Scores and TCAP Achievement Scores in Mathematics for Students in Grades Three Through Eight

#### *Research Question #5*

Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?

A univariate analysis of variance was used to determine if there is a relationship between years of teaching experience and TCAP achievement scores in reading. Table 2 shows the total number of reading and mathematics teachers in each group.

Table 2

*Number of Reading and Mathematics Teachers by Grade Level and Years of Experience*

Grade Level	3	4	5	6	7	8	Total
0 – 5	14	10	14	14	12	8	72
6 – 10	4	3	10	7	3	7	34
More than 10	22	20	11	6	9	13	81

Ho5: There is no relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores (criterion referenced raw scores) in reading of students in grades three through eight.

A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in third grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,37) = .56, p = .58$ . Therefore, the null hypothesis Ho5 for teacher years of experience and third grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was small (.02). Table 3 shows the means and standard deviations for third-grade reading by teachers' years of experience.

Table 3

*Means and Standard Deviations for Third-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	46.31	4.51
6 - 10 years	4	48.16	1.75
more than 10 years	22	45.67	4.56
Total	40	46.14	4.33

Figure 3 shows the distribution of third-grade reading by teachers' years of experience.



*Figure 3. Boxplot for Teacher Years of Experience and Third-Grade TCAP Achievement Scores in Reading*

A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in fourth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,30) = 2.67, p = .09$ . Therefore, the null hypothesis  $H_{05}$  for teacher years of experience and fourth-grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was large (.15). Based on the large effect size, the strength of the relationship may be the result of systemic professional development in reading that teachers accrue over a number of years in Hamblen County. Table 4 shows the means and standard deviations for fourth-grade reading by teacher years of experience.

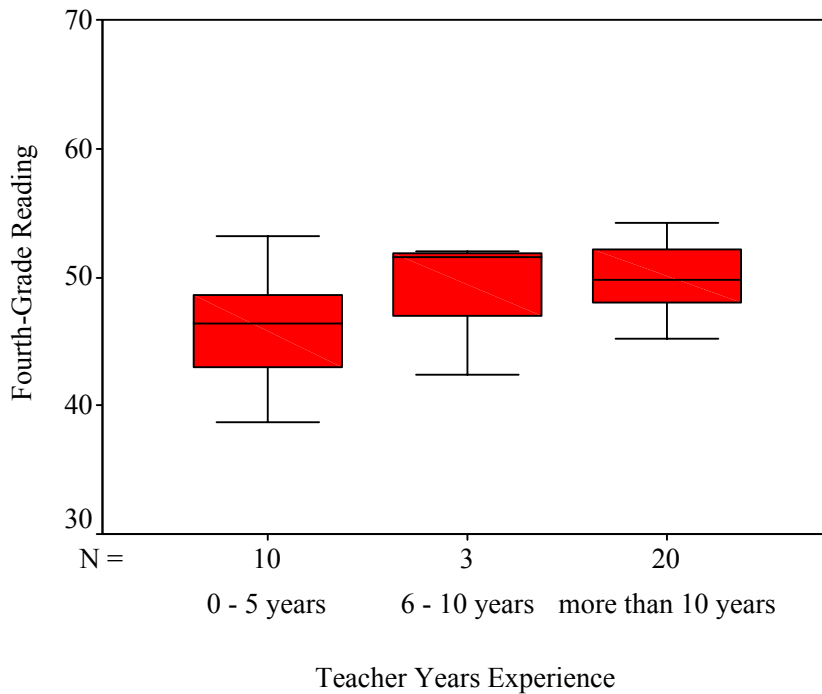
Table 4

*Means and Standard Deviations for Fourth-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	10	46.00	4.03
6 - 10 years	3	48.66	5.47
more than 10 years	20	50.02	4.59
Total	33	48.68	4.73

Figure 4 shows the distribution of fourth-grade reading by teacher years of experience.





*Figure 4.* Boxplot for Teacher Years of Experience and Fourth-Grade TCAP Achievement Scores in Reading

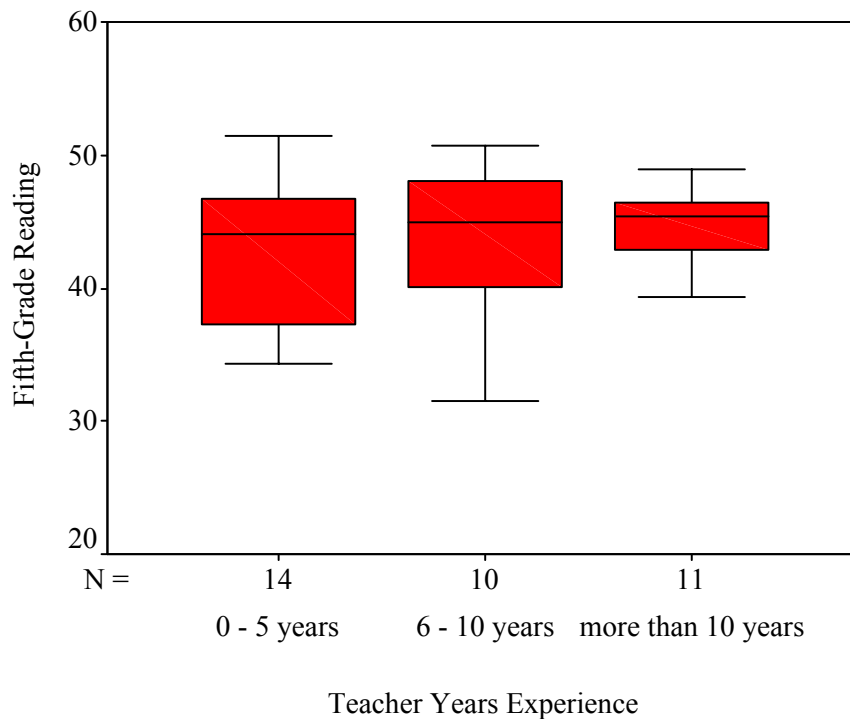
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in fifth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,32) = .10, p = .91$ . Therefore, the null hypothesis  $H_{05}$  for teacher years of experience and fifth-grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was small (.01). Table 5 shows the means and standard deviations for fifth-grade reading by teacher years of experience.

Table 5

*Means and Standard Deviations for Fifth-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	42.88	5.28
6 - 10 years	10	43.59	5.70
more than 10 years	11	43.78	5.08
Total	35	43.37	5.19

Figure 5 shows the distribution of fifth-grade reading by teacher years of experience.



*Figure 5. Boxplot for Teacher Years of Experience and Fifth-Grade TCAP Achievement Scores in Reading*

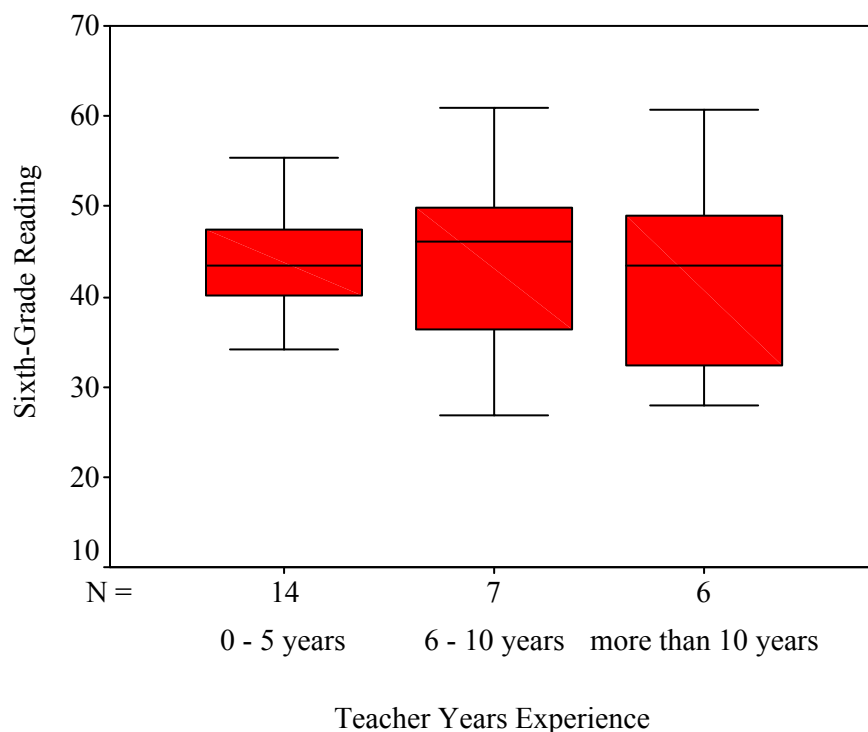
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in sixth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,24) = .04, p = .96$ . Therefore, the null hypothesis  $H_{05}$  for teacher years of experience and sixth-grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was small ( $< .01$ ). Table 6 shows the means and standard deviations for sixth-grade reading by teacher years of experience.

Table 6

*Means and Standard Deviations for Sixth-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	42.36	8.72
6 - 10 years	7	43.76	11.61
more than 10 years	6	42.77	11.95
Total	27	42.82	9.85

Figure 6 shows the distribution of sixth-grade reading by teacher years of experience.



*Figure 6.* Boxplot for Teachers Years Experience and Sixth-Grade TCAP Achievement Scores in Reading

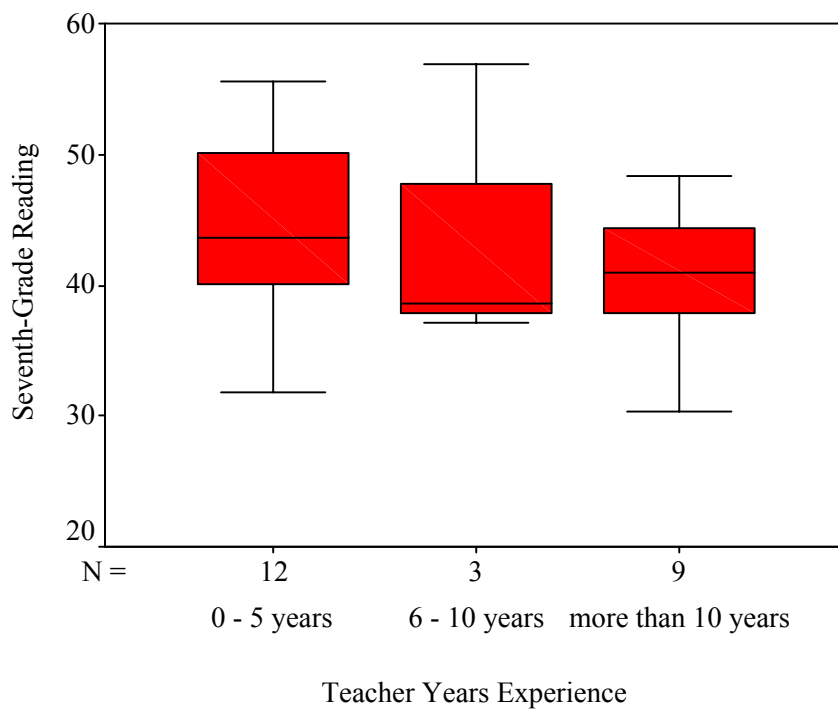
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in seventh grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,21) = .25, p = .78$ . Therefore, the null hypothesis  $H_0$  for teacher years of experience and seventh-grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was small (.02). Table 7 shows the means and standard deviations for seventh-grade reading by teacher years of experience.

Table 7

*Means and Standard Deviations for Seventh-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	12	44.36	7.32
6 - 10 years	3	44.18	11.04
more than 10 years	9	41.97	7.74
Total	24	43.44	7.65

Figure 7 shows the distribution of seventh-grade reading by teacher years of experience.



*Figure 7. Boxplot for Teachers Years Experience and Seventh-Grade TCAP Achievement Scores in Reading*

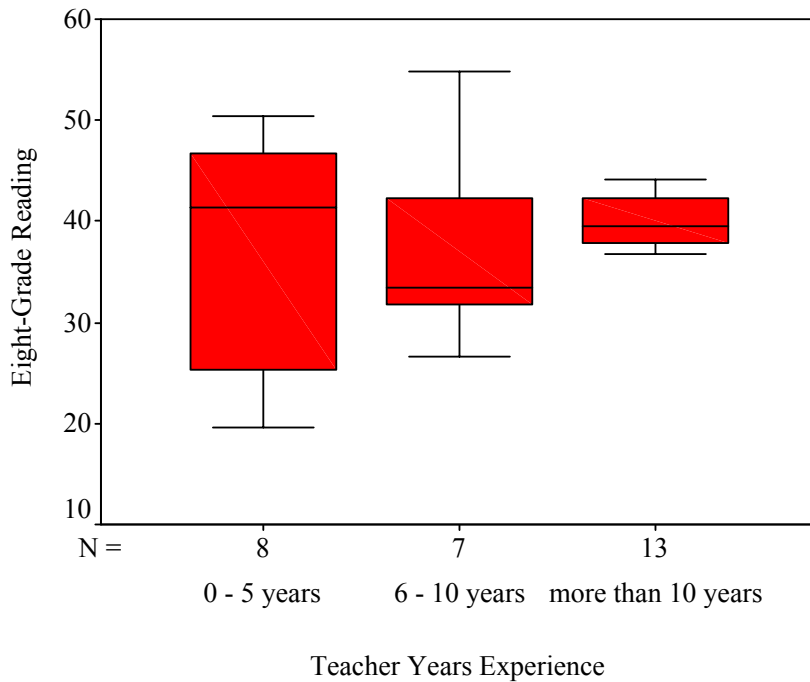
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in reading of students in eighth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in reading. The ANOVA was not significant,  $F(2,25) = .83, p = .45$ . Therefore, the null hypothesis  $H_0$  for teacher years of experience and eighth-grade scores in reading was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a medium effect (.06). Table 8 shows the means and standard deviations for eighth-grade reading by teacher years of experience.

Table 8

*Means and Standard Deviations for Eight-Grade Reading by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	8	37.09	11.96
6 - 10 years	7	37.60	10.16
more than 10 years	13	41.69	5.65
Total	28	39.35	8.90

Figure 8 shows the distribution of eighth-grade reading by teacher years of experience.



*Figure 8.* Boxplot for Teacher Years Experience and Eighth-Grade TCAP Achievement Scores in Reading

#### *Research Question #6*

Is there a relationship between years of teaching experience (low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years experience) and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

Ho6: There is no relationship between years of teaching experience and 2006-2007 TCAP achievement annual scores in mathematics of students in grades three through eight.

A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in third grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more

than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,37) = .58, p = .56$ . Therefore, the null hypothesis Ho6 for teacher years of experience and third-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a small effect (.03). Table 9 shows the means and standard deviations for third-grade mathematics by teacher years of experience.

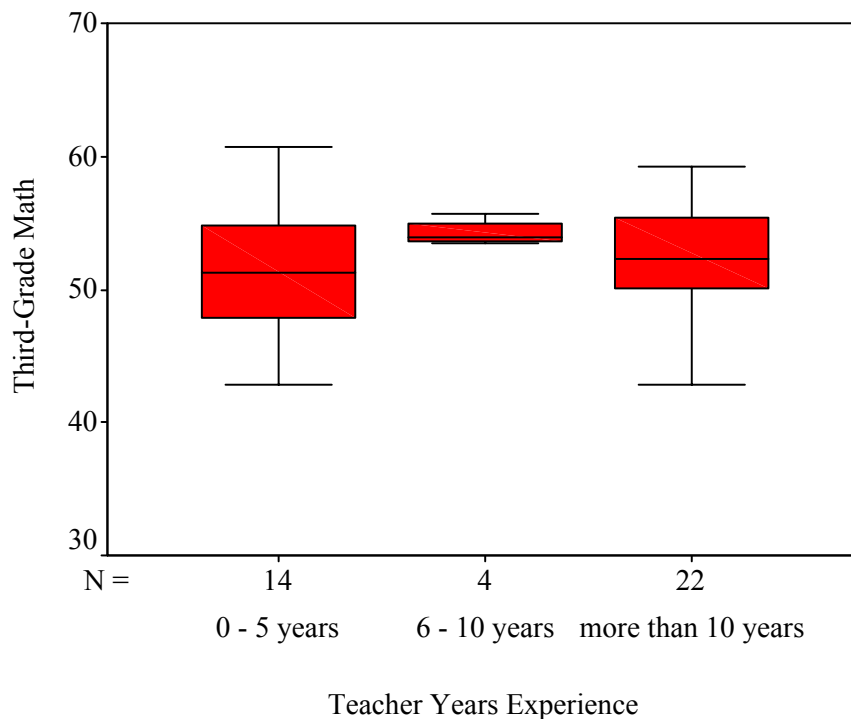
Table 9

*Means and Standard Deviations for Third-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	51.47	4.65
6 - 10 years	4	54.26	1.01
more than 10 years	22	51.71	5.03
Total	40	51.88	4.64

Figure 9 shows the distribution of third-grade mathematics by teacher years of experience.





*Figure 9.* Boxplot for Teacher Years of Experience and Third-Grade TCAP Achievement Scores in Mathematics

A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in fourth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,30) = 2.93, p = .07$ . Therefore, the null hypothesis  $H_{06}$  for teacher years of experience and fourth-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a large effect (.16). In light of the large effect size, failure to reject the null

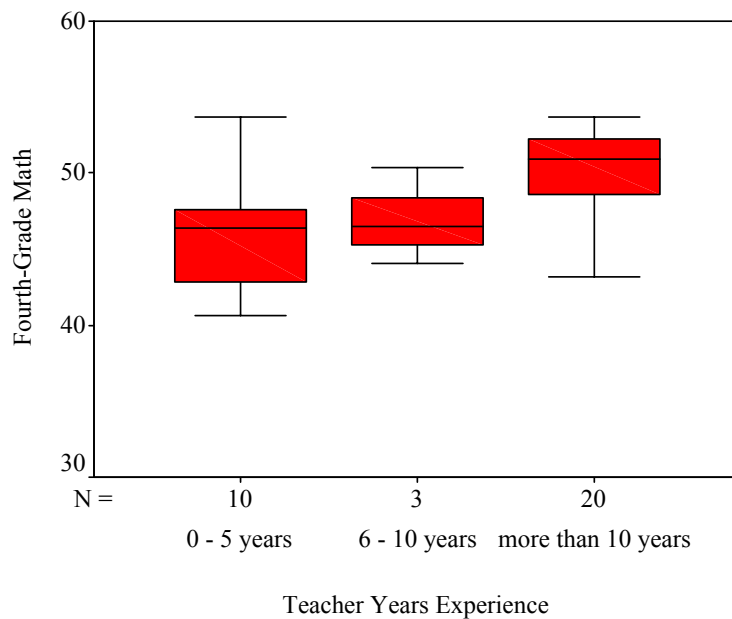
hypothesis ( $p = .07$ ) was a consequence of the small sample size ( $N = 33$ ). Table 10 shows the means and standard deviations for fourth-grade mathematics by teacher years of experience.

Table 10

*Means and Standard Deviations for Fourth-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	10	46.58	5.05
6 - 10 years	3	46.97	3.14
more than 10 years	20	49.95	3.14
Total	33	48.66	4.04

Figure 10 shows the distribution of fourth-grade mathematics by teacher years of experience.



*Figure 10.* Boxplot for Teacher Years of Experience and Fourth-Grade TCAP Achievement Scores in Mathematics

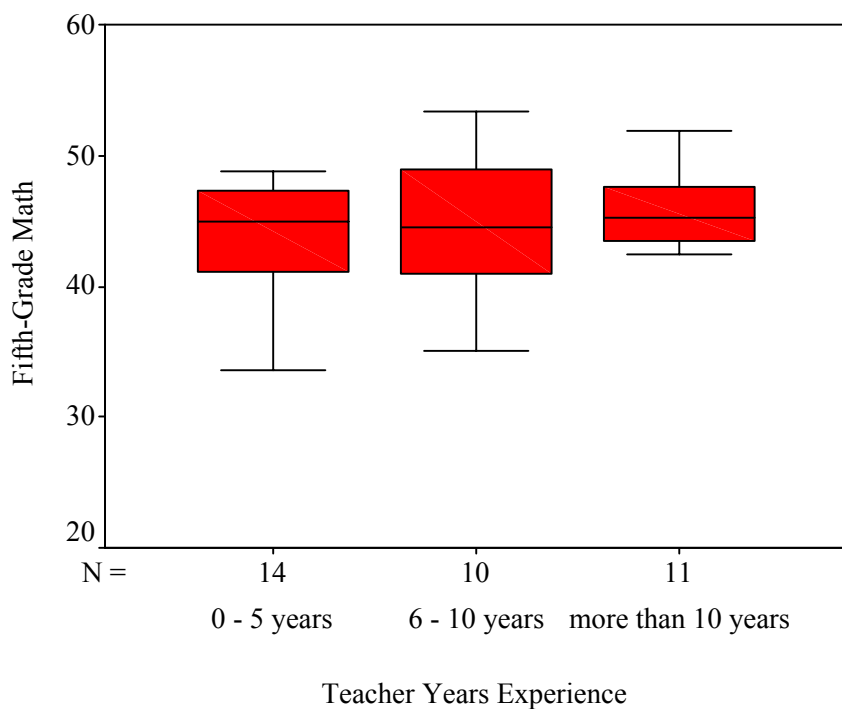
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in fifth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,32) = .12, p = .89$ . Therefore, the null hypothesis  $H_0$  for teacher years of experience and fifth-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a small effect ( $< .01$ ). Table 11 shows the means and standard deviations for fifth-grade mathematics by teacher years of experience.

Table 11

*Means and Standard Deviations for Fifth-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	43.82	4.31
6 - 10 years	10	44.79	5.59
more than 10 years	11	44.56	5.96
Total	35	44.33	5.10

Figure 11 shows the distribution of fifth-grade mathematics by teacher years of experience.



*Figure 11.* Boxplot of Teacher Years Experience and Fifth-Grade TCAP Achievement Scores in Mathematics

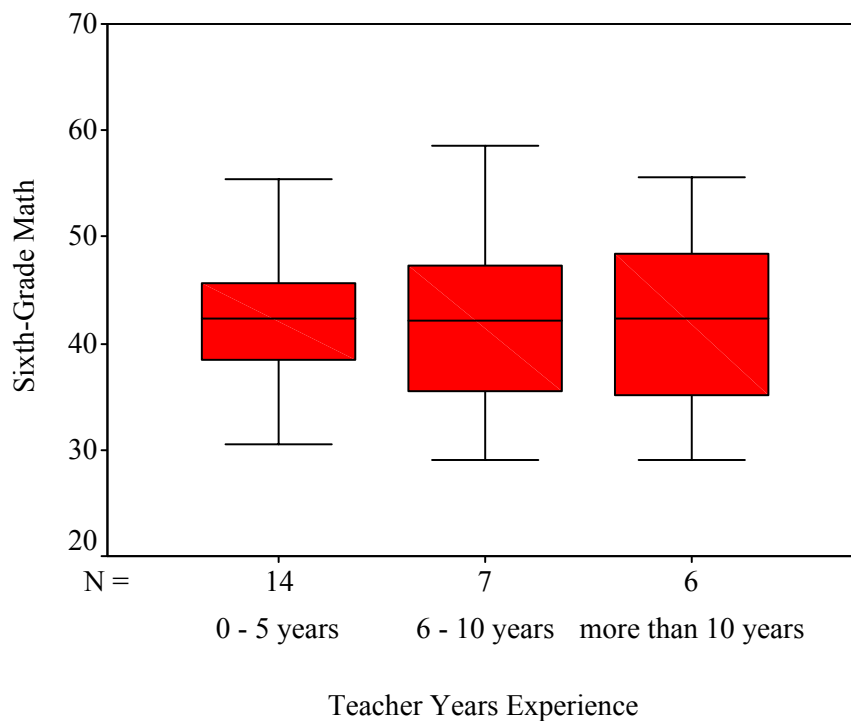
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in sixth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,24) = < .01, p = 1.00$ . Therefore, the null hypothesis  $H_0$  for teacher years of experience and sixth-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a small effect ( $< .01$ ). Table 12 shows the means and standard deviations for sixth-grade mathematics by teacher years of experience.

Table 12

*Means and Standard Deviations for Sixth-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	14	42.23	6.61
6 - 10 years	7	42.15	10.33
more than 10 years	6	42.14	9.86
Total	27	42.19	8.07

Figure 12 shows the distribution of sixth-grade mathematics by teacher years of experience.



*Figure 12. Boxplot of Teacher Years Experience and Sixth-Grade TCAP Achievement Scores in Mathematics*

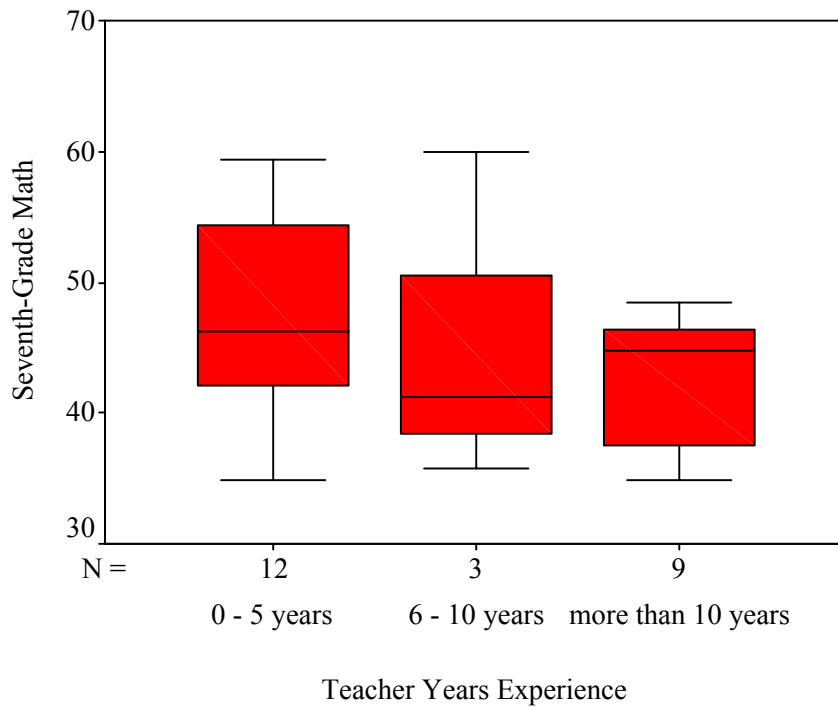
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in seventh grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,21) = .39, p = .68$ . Therefore, the null hypothesis Ho6 for teacher years of experience and seventh-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a small effect (.04). Table 13 shows the means and standard deviations for seventh-grade mathematics by teacher years of experience.

Table 13

*Means and Standard Deviations for Seventh-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	12	47.16	8.17
6 - 10 years	3	45.60	12.68
more than 10 years	9	43.77	8.28
Total	24	45.69	8.51

Figure 13 shows the distribution of seventh-grade mathematics by teacher years of experience.



*Figure 13.* Boxplot of Teacher Years Experience and Seventh-Grade TCAP Achievement Scores in Mathematics

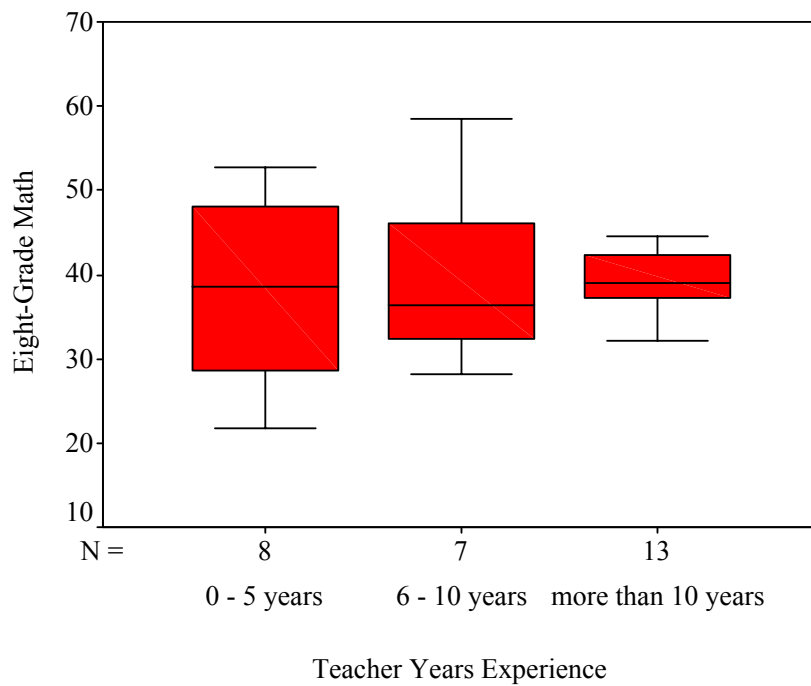
A one-way analysis of variance was conducted to determine if there is a relationship between years of experience and 2006-2007 TCAP achievement annual scores in mathematics of students in eighth grade. The independent variable, years of experience, included three groupings: low = 0 through 5 years of experience, middle = 6 through 10 years of experience, high = more than 10 years of experience. The dependent variable was the TCAP mean scores in mathematics. The ANOVA was not significant,  $F(2,25) = .26, p = .77$ . Therefore, the null hypothesis  $H_{06}$  for teacher years of experience and eighth-grade scores in mathematics was retained. The strength of the relationship between TCAP scores and years of experience as assessed by  $\eta^2$  was a small effect (.02). Table 14 shows the means and standard deviations for eighth-grade mathematics by teacher years of experience.

Table 14

*Means and Standard Deviations for Eight-Grade Math by Teachers' Years of Experience*

Teachers' Years of Experience	<i>N</i>	<i>M</i>	<i>SD</i>
0 - 5 years	8	38.00	11.26
6 - 10 years	7	40.00	11.41
more than 10 years	13	41.27	7.98
Total	28	40.04	9.59

Figure 14 shows the distribution of eighth-grade mathematics by teacher years of experience.



*Figure 14. Boxplot for Teacher Years Experience and Eighth-Grade TCAP Achievement Scores in Mathematics*



## CHAPTER 5

### SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to determine if a relationship exists between teacher variables and the Tennessee Comprehensive Assessment Program annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee. The teacher variables were days absent, Praxis II Principles of Learning and Teaching scores, and years of experience. The 2006-2007 TCAP scores in reading and mathematics for students in grades three through eight was the testing variable.

#### *Summary of Findings*

The statistical analysis was based on six research questions introduced in Chapter 1. The teacher variable of days absent included all days absent whether defined as sick days or personal days. The Praxis II Principle of Learning and Teaching scores were grouped as below or above the median score. Teachers scoring at the median were grouped as above the median score. Years of experience was defined as those years recognized by the Tennessee Department of Education as vested years of experience. All teacher variable data were collected from the school district's central office from teachers employed during the 2006-2007 school year in Hamblen County, Tennessee. The 2006-2007 TCAP scores were retrieved from the CTB McGraw Hill Testmate Clarity electronic program located at the school district's central office. The TCAP scores included all students in grades three through eight participating in the achievement test during a specific testing date determined by the local school district.

### *Research Question #1*

Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?

A correlation coefficient was used to determine if a relationship exists between teachers' days absent and TCAP annual scores in reading for each grade level.

The total number of teachers' days absent ranged from 11 to 12 days for each grade level. Teacher absenteeism in Hamblen County, Tennessee for the 2006-2007 school year ranged from 5.5% to 6%; this is lower than a study conducted by Strauss & Strauss (2003) for the Pittsburgh Foundation. The absenteeism rates for Hamblen County teachers are higher than absenteeism rates reported at 3% to the U.S. Bureau of Labor Statistics during the years of 1992-2001.

The possible raw score range for the TCAP reading achievement test was 0 – 67 for grades three through eight. The TCAP annual mean raw scores for students in grades three through five ranged from 43.37 to 48.68 with standard deviations ranging from 4.33 to 5.19. The TCAP annual mean raw scores for students in grades six through eight ranged from 39.35 to 43.44 with standard deviations ranging from 7.64 to 9.85. The TCAP annual mean raw scores suggest, but do not conclude, that teacher absenteeism may have more of a negative effect on student achievement in grades six through eight than student achievement in grades three through five.

With the exception of teachers' days absent and fourth-grade TCAP achievement test scores in reading, the correlation coefficients were generally negative with results ranging from -.15 to .05. There was no significant relationship between teachers' days absent and TCAP achievement test scores in reading. These results differ from the large urban study conducted by Bruno (2002) in determining a relationship between teacher absenteeism and student achievement.

### *Research Question #2*

Is there a relationship between teachers' days absent and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

A correlation coefficient was used to determine if a relationship exists between teachers' days absent and TCAP annual scores in mathematics for each grade level.

The TCAP mathematics test for students in grades three through eight had a possible raw score range of 0 – 67. Mean raw scores for students in grades three through five ranged from 44.33 to 51.88 with standard deviations ranging from 4.04 to 5.10. Mean raw scores for students in grades six through eight ranged from 40.04 to 45.70 with standard deviations ranging from 8.07 to 9.59.

Generally, there was a weak relationship of correlation coefficients ranging from -.14 to .26. There was no significant difference between teachers' days absent and TCAP achievement annual scores in mathematics for students in grades three through eight. The findings for this research question are not in agreement with the findings of Bayard (2003) concerning teacher absenteeism. Bayard (2003) concluded that teacher absenteeism in excess of 2 days resulted in lower achievement scores in mathematics; however, those results had a small negative effect. A study conducted by Duflo and Hanna (2005) in the tribal regions of India using teacher attendance incentives reported that a decrease of teacher absenteeism increased student achievement.

### *Research Question #3*

Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP Achievement test annual scores in reading of students in grades three through eight?

An independent-samples *t* test was used to determine if there is a relationship between teachers' Praxis II PLT scores and TCAP test annual scores in reading of students in grades three through eight.

The total number of teachers participating in the Praxis II PLT was 35.29% of the study population. The possible score range for the Praxis II PLT was 100-200 points and a median score of 174. Teachers employed by the Hamblen County school district who participated in the Praxis II PLT scoring below the median range were 56%. The student TCAP mean reading score for teachers' scoring above the median on the Praxis exam was less than one point higher than the student TCAP mean reading score for teachers' scoring below the median on the Praxis exam.

The findings for the relationship between teachers' Praxis II Principles of Learning and Teaching scores and TCAP Achievement test annual scores in reading of students in grades three through eight were not significant. These results are similar to research conducted by Darling-Hammond (2000) and Rogness (2005) in establishing that the relationships between teacher examination scores and student achievement or principal ratings of teacher effectiveness in not conclusive.

#### *Research Question #4*

Is there a relationship between teachers' Praxis II Principles of Learning and Teaching scores and 2006-2007 TCAP Achievement test annual scores in mathematics of students in grades three through eight?

An independent-samples *t* test was used to determine if there is a relationship between teachers' Praxis II PLT scores and TCAP test annual scores in mathematics of students in grades three through eight.

The mean scores for teacher Praxis II PLT scores above the median ( $M = 46.25$ ) was similar to mean scores for teachers with Praxis II PLT scores below the median ( $M = 44.74$ ). The mean for Praxis II Principles of Learning and Teaching scores above the median were higher than the mean for Praxis II Principles of Learning and Teaching scores below the median that indicates that there is a positive relationship between Praxis II PLT scores and student achievement in mathematics.

The findings for the relationship between teachers' Praxis Principles of Learning and Teaching scores and TCAP Achievement test annual scores in mathematics of students in grades three through eight were not significant. The results of the study are not consistent in direction with negative results found by Strauss and Vogt (2002) concerning the relationship between teacher examination scores of professional knowledge and student achievement. However, similar to the results found by Strauss and Vogt, the results of the Hamblen County, Tennessee study found that teacher examination scores of professional knowledge did not have a statistically significant effect on measures of student achievement.

#### *Research Question #5*

Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in reading of students in grades three through eight?

A univariate analysis of variance (ANOVA) was used to determine if there is a relationship between years of teaching experience and TCAP achievement scores in reading of students in each grade level.

The results of the ANOVA indicate that students with teachers who have more than 10 years of experience score higher on the TCAP achievement test in fourth, fifth, and eighth grades in reading. Students with teachers who have 6 – 10 years of experience score higher on the TCAP achievement test in third and sixth grades in reading. Students with teachers who have 0 – 5 years of experience score higher on the TCAP achievement test in seventh grade in reading. The fourth grade results included a large effect size and the eighth grade results included a medium effect size. These findings could be because of the small sample size of the study. The data show evidence, but not conclusive, that there might be a positive relationship between years of experience and student achievement scores in reading in Hamblen County, Tennessee.

The findings for teachers' years of experience and TCAP achievement test annual scores in reading were not significant. However, these results were not in agreement with research conducted by Clotfelter, Ladd, and Vigdor (2004). This research conducted in North Carolina

found that years of experience yielded significant returns in student achievement. Teachers with fewer years of experience were often placed in classes with students with below average achievement levels. Darling-Hammond (2000) credits student achievement in reading with teachers who have been exposed to large amounts of professional development leading to expertise in reading instruction. These well-trained teachers tended to incorporate richer reading programming into the classroom. Berliner and Scherer (2001) emphasize the importance of years of experience by attributing case knowledge from the accumulated field experience of teachers.

#### *Research Question #6*

Is there a relationship between years of teaching experience and 2006-2007 TCAP achievement test annual scores in mathematics of students in grades three through eight?

A univariate analysis of variance (ANOVA) was used to determine if there is a relationship between years of teaching experience and TCAP achievement scores in mathematics of students in each grade level.

The findings of this research question indicate that students of teachers with more than 10 years of experience score higher on the TCAP achievement test in mathematics in fourth and eighth grades. Students of teachers with 6 – 10 years of experience score higher on the TCAP achievement test in mathematics in third and fifth grades. Students of teachers with 0 – 5 years of experience score higher on the TCAP achievement test in mathematics in sixth and seventh grades.

There is no significant difference in the relationship between teachers' years of experience and TCAP scores in mathematics of students in grades three through eight in Hamblen County, Tennessee. The corresponding research associated with the null hypothesis is mixed. Klecker (2002) found that students of mathematics teachers with more years of experience scored higher on the mathematics portion of the National Assessment of Educational Progress exam, although the effect was small. Felter (2001) also reported that students with

well-prepared mathematics teachers defined by years of experience had higher mathematics achievement scores. Jones et al. (2006) in research conducted by the Southwest Development Laboratory found that years of experience was negatively related to student achievement in mathematics in Texas at the eighth-grade level and Louisiana at the fourth-grade level. In Texas at the fourth-grade level, years of experience and student achievement in mathematics had a negative relationship with decreased student achievement in mathematics for every 1-year increase in years of experience beyond 12 years of experience.

### *Conclusions*

The purpose of this study was to determine if there was any relationship between teacher variables and the Tennessee Comprehensive Assessment Program annual scores in reading and mathematics for students in grades three through eight in Hamblen County, Tennessee. The data collected for this study were statistically analyzed and the following conclusions are based on the findings.

1. Based on the results, there is no significant relationship between teachers' days absent and TCAP achievement test scores in reading for students in all grade levels with the exception of grade four. This exception might be an anomaly or because of the limited sample size. Upon inspection of the data, the number of fourth grade teacher absences was similar to the number of teacher absences in other grades. There is no significant relationship between teachers' days absent and TCAP achievement scores in mathematics for students in grades three through eight. Findings in the data indicate that although teachers absenteeism rates were similar across grade levels, students in the sixth, seventh, and eighth grade had lower mean TCAP scores in reading and mathematics than did students in the third, fourth, and fifth grades. These results indicate, but not conclusively, that teacher absenteeism might contribute to lower student achievement scores in the sixth, seventh, and eighth grades more than in third, fourth, and fifth grades. However, the results for each grade level were

not statistically significant. The findings of this study indicate that teachers' absenteeism rates in Hamblen County, Tennessee are not having an effect on TCAP scores in reading or mathematics and are lower than absenteeism rates in the study conducted by Strauss and Strauss (2003) and higher than the absenteeism rates of the United States Bureau of Labor Statistics (2006). The negative relationship between teachers' days absent and TCAP scores tends to support the importance of teacher attendance; however, the strength of the relationship in this study is weak.

2. Based on the findings of this study, there was no significant relationship between teachers' Praxis II Principles of Learning and Teaching scores and TCAP achievement scores in reading for students in grades three through eight. There was no significant relationship between teachers' Praxis II Principles of Learning and Teaching scores and TCAP achievement scores in mathematics for students in grades three through eight. Teachers hired in Hamblen County who have out-of-state or alternative licenses reduced the number of teachers participating in the Praxis II PLT examination. Therefore, 35.29% of the teachers in this study participated in the Praxis II PLT examination. The mean reading TCAP scores were higher for students in grades three through eight with teachers who had Praxis II PLT scores above the median score of 174. The mean mathematics TCAP scores were higher for students in grades three through eight with teachers who had Praxis PLT scores above the median score of 174. Evidence of the data suggests that Praxis II PLT scores have a positive, but not significant, relationship with student achievement in reading and mathematics.
3. There was no significant difference between years of experience and TCAP achievement scores in reading for students in grades three through eight. However, a larger number of grade levels are associated with higher scores on TCAP achievement tests in reading of teachers with more than 10 years of experience. There was no significant difference between years of experience and TCAP



achievement scores in mathematics for students in grades three through eight. Higher and lower TCAP scores in mathematics were evenly distributed across the years of experience groupings. The total number of teachers in this study was not evenly distributed throughout the years of experience groupings. The percentage of teachers in each years of experience category was as follows: 39% in the 0 – 5 years of experience; 18% in the 6 – 10 years of experience grouping; and 43% in the more than 10 years of experience grouping. This pattern of teacher attrition is in agreement with research conducted by Darling-Hammond (2000).

### *Recommendation for Practice*

Based on the findings and conclusions of the study, one recommendation for practice is that the Hamblen County school district, when considering bonus pay, should consider other variables associated with a teacher's effectiveness rather than attendance, Praxis II PLT scores, and years of experience. These variables could include the ability to communicate with students and peers, positive attitudes toward learning, and an overall attention to individual student need.

### *Recommendations for Further Research*

Hamblen County Department of Education strives to provide the best opportunities for the students in our district. The ability to analyze all data collected in the district and create policies and procedures that address self-improvement is important for the success of our students in today's changing world. The following recommendations for further research are designed to guide future studies:

1. This study should be replicated using a larger population.
2. A comparison study of teachers' days absent should be conducted with other school districts in the region and state.
3. An investigation using a qualitative approach should be conducted within the classroom targeting teacher variables that might contribute to improved student

achievement such as communication skills, professional attitude, enthusiasm, and knowledge of subject matter.

4. This study should be replicated using TCAP scores for science and social studies.
5. In response to the rejection of the null hypothesis concerning the relationship between teacher absenteeism and fourth-grade student achievement in reading, an investigation should be conducted using student subgroup categories such as race, gender, and children in poverty.
6. This study should be replicated using secondary student data of first time Gateway test takers in English, biology, and algebra.

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## APPENDICES

### APPENDIX A

#### Letter to Director of Schools

June 25, 2007

Dr. Dale P. Lynch, Director  
Hamblen County Department of Education  
210 E. Morris Blvd.  
Morristown, Tennessee 37813

Dear Dr. Lynch,

This letter is a request for permission to use data from the Hamblen County Department of Education. I am completing my doctoral dissertation at East Tennessee State University. This study is entitled "An Analysis of the Relationship between Teacher Characteristics and Student Achievement Scores in Hamblen County, Tennessee". The following specific data is requested:

1. Student achievement scores from the Tennessee Comprehensive Assessment Program in reading and mathematics for the 2006-2007 school year in grades three through eight
2. Teacher absenteeism rates for the 2006-2007 school year
3. Teacher levels of postsecondary education, license examination scores, years of experience, and years of experience teaching reading and mathematics

The confidentiality of student test scores will be protected. Teacher participant data will be coded to maintain anonymity during data analysis. The Institutional Review Board has approved the data collection. A copy of the final dissertation will be made available to you upon request.

Sincerely,

Anne Nelson

PERMISSION GRANTED FOR THE USE REQUESTED ABOVE:

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Dr. Dale Lynch, Director

## APPENDIX B

### TCAP and Content Standard Alignment Summary

#### *Alignment Verification Summary (reading and language arts)*

Grade	Score Reporting Category	No. of items	No. of PI*	No.(%) of PI Assessed
3	1. Content	6	5	3 (60)
	2. Meaning	9	5	5 (100)
	3. Vocabulary	10	9	7 (78)
	4. Writing/organization	5	7	4 (57)
	5. Writing/process	5	7	4 (57)
	6. Grammar/conventions	10	8	8 (100)
	7. Techniques and skills	5	6	5 (83)
4	1. Content	8	5	5 (100)
	2. Meaning	6	7	4 (57)
	3. Vocabulary	7	6	5 (83)
	4. Writing/organization	5	9	5 (56)
	5. Writing/process	6	8	6 (75)
	6. Grammar/conventions	12	8	7 (88)
	7. Techniques and skills	11	10	8 (80)
5	1. Content	12	9	8 (89)
	2. Meaning	6	6	5 (83)
	3. Vocabulary	9	7	6 (86)
	4. Writing/organization	5	8	5 (63)
	5. Writing/process	11	10	8 (80)
	6. Grammar/conventions	7	8	7 (88)
	7. Techniques and skills	5	7	3 (43)
6	1. Content	6	6	5 (83)
	2. Meaning	8	7	5 (71)
	3. Vocabulary	6	6	6 (100)



7	4. Writing/organization	6	7	5 (71)
	5. Writing/process	8	8	7 (88)
	6. Grammar/conventions	9	10	8 (80)
	7. Techniques and skills	12	11	10 (91)
	1. Content	9	8	8 (100)
	2. Meaning	5	6	4 (67)
	3. Vocabulary	8	7	6 (86)
8	4. Writing/organization	6	7	5 (71)
	5. Writing/process	10	8	8 (100)
	6. Grammar/conventions	7	8	6 (75)
	7. Techniques and skills	10	10	8 (80)
	1. Content	9	8	8 (100)
	2. Meaning	7	7	6 (86)
	3. Vocabulary	5	5	5 (100)
	4. Writing/organization	6	5	5 (100)
	5. Writing/process	8	7	7 (100)
	6. Grammar/convention	11	9	8 (82)
	7. Techniques and skills	9	10	6 (60)

*Alignment Verification Summary (mathematics)*

Grade	Score Reporting Category	No. of items	No. of PI*	No.(%) of PI Assessed
3	1. Number sense and theory	10	9	9 (100)
	2. Computation	5	4	4 (100)
	3. Algebraic thinking	9	8	8 (100)
	4. Real world problem solving	6	6	6 (100)
	5. Data analysis and probability			
	6. Measurement	6	6	6 (100)
	7. Geometry			
4	1. Number sense/theory	8	7	7 (100)
	2. Computation	6	5	5 (100)
	3. Algebraic thinking	12	9	9 (100)
	4. Real world problems			
	5. Data analysis and probability	4	4	4 (100)
		10	7	7 (100)
	6. Measurement			
	7. Geometry	6	3	3 (100)
	1. Number sense/theory			
	2. Computation			
5	3. Algebraic thinking	6	5	4 (80)
	4. Real world problem solving	8	7	7 (100)
	5. Data analysis and probability	6	5	5 (100)
		10	9	9 (100)
	6. Measurement			
	7. Geometry	6	4	4 (100)

6	1. Number and operations	10	9	5 (56)
	2. Algebraic thinking			
	3. Real world problem solving	6	5	5 (100)
	4. Data analysis and probability	8	7	7 (100)
	5. Measurement			
	6. Geometry	8	7	7 (100)
7	7. Number and operations	7	6	6 (100)
	1. Algebraic thinking	13	10	10 (100)
	2. Graphs and graphing			
	3. Real world problem solving	10	8	7 (88)
	4. Data analysis and probability	8	6	6 (100)
	5. Measurement			
7	6. Geometry	9	7	7 (100)
	1. Number and operation			
	2. Algebraic thinking	7	6	6 (100)
	3. Graphs and graphing	8	6	6 (100)
	4. Real world problem solving	13	11	11 (100)
	5. Data analysis and probability	10	8	8 (100)
7	6. Measurement	5	4	4 (100)
	7. Geometry	5	5	5 (100)
		8	7	7 (100)

8	8	7	7 (100)
	6	5	5 (100)
	10	9	9 (100)
	10	8	7 (88)
	6	5	5 (100)
	7	6	6 (100)
	8	7	7 (100)
	8	7	7 (100)
	6	6	6 (100)

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(Tennessee Department of Education, 2006)

## APPENDIX C

### TCAP Score and Reliability Summary

#### *Number Correct Score Statistics and Test Reliability*

Content Area	Grade	No. of Items	Mean	SD	KR20
Reading	3	60	39.58	11.52	0.92
	4	60	40.41	11.09	0.92
	5	60	38.41	10.58	0.91
	6	60	38.76	11.55	0.92
	7	60	36.91	11.05	0.91
	8	60	37.46	10.55	0.90
Mathematics	3	60	45.69	9.54	0.92
	4	60	43.21	10.05	0.91
	5	60	41.20	10.50	0.91
	6	60	39.87	11.42	0.93
	7	60	39.22	12.03	0.93
	8	60	38.12	12.09	0.93

(Tennessee Department of Education, 2006)

## APPENDIX D

### Teacher Attendance in Developing Countries

#### *PETS Project Teacher Attendance*

Country	Primary School Absenteeism Rate (%)
Ecuador, 2002	16
Honduras, 2000	14
India, 2002	25
Indonesia, 2002	18
Papua New Guinea, 2001	15
Peru, 2002	13
Uganda, 2002	26
Zambia, 2002	17
(Reinikka & Smith, 2004)	

VITA  
ANNE NELSON

Personal Data:      Date of Birth: March 20, 1958  
                         Place of Birth: Newport, Tennessee  
                         Marital Status: Married

Education:           University of Tennessee, Knoxville;  
                         Bachelor of Science, Special Education,  
                         1986  
  
                         University of Tennessee, Knoxville;  
                         Master of Science, Curriculum and Instruction,  
                         1990  
  
                         Lincoln Memorial University, Harriman, TN;  
                         Administration and Supervision, Ed.S.,  
                         1998  
  
                         East Tennessee State University, Johnson City, Tennessee;  
                         Educational Leadership and Policy Analysis, Ed.D.,  
                         2008

Professional  
Experience:

                         Special Education Teacher  
                         Horace Maynard High School, Maynardville, TN  
                         1986-1989  
  
                         Special Education Teacher, Consultative Teacher  
                         Hamblen High East, Morristown, TN  
                         1989-1995  
  
                         Special Education Teacher, Consultative Teacher  
                         Sevier County High School, Sevierville, TN  
                         1995-2005  
  
                         Supervisor of Special Services  
                         Hamblen County Department of Education, Morristown, TN  
                         2005-Present

## Honors and

- Awards:
- Member of the Consolidated Planning Committee for Hamblen County School District  
2005–present
  - Member of the Hamblen County Negotiations Team  
2005–present
  - Chair of the Hamblen County Cyclical Performance Review for Hamblen County Department of Special Education  
2005–present
  - Co – chair of the Hamblen County School Coordinated Health Team  
2006–present
  - Professional Development Coordinator for Special Services Department  
Hamblen County Department of Education  
2005–present
  - In-service presenter on the Tennessee Teacher Evaluation Model with emphasis on meeting NCLB requirements  
2004–2005
  - Sponsor of various extracurricular activities:
    - Beta Club
    - cheerleading, girls
    - basketball coach
    - Special Olympics 1986–2005
  - Highly qualified teacher in the area of special education K-6